THE TREATISE ON INDIAN MEDICINAL PLANTS

ASIMA CHATTERJEE
SATYESH CHANDRA PAKRASHI

VOL 2

PUBLICATIONS & INFORMATION
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ABOUT THE TREATISE
VOL. 2

This is the second in the series of six volumes on the Treatise on Indian Medicinal Plants. It incorporates one hundred and twenty species of dicotyledonous flowering plants. By and large, the features and the pattern presented in the earlier volume has been maintained. In addition, attempts have been made to specify the parts from which the important chemical constituents have been isolated. As in the previous volume, each plant is illustrated either with photograph or line sketch. To make the volume self-contained, the basic concepts, glossaries of the various terms used and the books referred to have been repeated with appropriate revision along with the list of plant species dealt with in Volume 1.

Like the previous one, this volume will, also, be welcomed both by the specialists and all those interested in traditional medicine.

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Editors

Prof. (Mrs.) Asima Chatterjee
Dr. Satyesh Chandra Pakrashi

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Preface

The present volume of "The Treatise on Indian Medicinal Plants" incorporates one hundred and twenty species. By and large, the same pattern of presentation of the earlier volume in the series has been maintained except that the specific parts of the plants from which the important chemical constituents occur have been mentioned whenever such information was available. It was also thought expedient to repeat the "Basic concepts of Ayurveda", Glossary of Sanskrit/Ayurvedic Terms, Medical Terms and "List of Books referred to" in this and the future volumes in the series with necessary additions.

One of the major difficulties we had to encounter in compiling this volume was the common vernacular names for a number of plants. Some of the different species of the same genus are known by the identical name, *Chaulmoogra* (*Hydnocarpus kurzii*, *H. laurifolia* and *H. wightiana*), while others belonging to the different genus are also known by the same name e.g., both *Mesua ferrea* and *Mammea longifolia* are known as *Nagakesara*. We followed *Bhavaprakasa* and *Rajanighantu* to resolve such confusions with regard to Sanskrit names and assigned the slokas accordingly with proper discussions incorporated as foot notes. The valid botanical names and synonyms have been used in consultation with *The Useful Plants of India* by S.P. Ambasta (1986) and "Name Changes in Flowering Plants of India and Adjacent Regions" by S.S.R. Bennet (1987).

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Professor (Mrs.) ASIMA CHATTERJEE
Dr. S.C. PAKRASHI

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BASIC CONCEPTS OF AYURVEDA

Dosha

According to Ayurveda, the entire biological process of the living organisms is governed by three essential factors, viz., *Vāyu*, *Pitta* and *Kapha* which are individually called *Dosha* and grouped together as "*Tridosha*". Abnormalities or maladies are considered to be effects of imbalance of *Tridosha*.

Tridosha

(a) *Vāyu (Vāta)* : It explains all the biological phenomena which are controlled by the functions of central and autonomic nervous systems. The malfunction of *Vayu* is the major factor in developing diseases either by itself or coupled with other functional disorders due to *Pitta* and *Kapha*.

(b) *Pitta* : It is the manifestation of energy (*Tejas*) in the living organisms that helps digestion, assimilation, tissue building, heat production, blood-pigmentation, activities of the endocrine glands and so on. Many of these processes are thermogenic and metabolic.

(c) *Kapha* (Sleshma) : It implies the functions of thermo-taxis or heat regulation and also formation of various preservative fluids, e.g., mucus, synovia etc.

Main function of *Kapha* is to provide nutrition to body-tissues, to bring about co-ordination of body-system and regularisation of all biological processes.

Basis of Drug-Action

(i) *Rasa* : Of those described by Ayurveda, *rasa* is based on taste. Different types of taste of herbal drugs are considered to induce different physiological activities in the body depending on their constituents. The types of tastes are as follows:

Madhura	(Sweet)	*Katu*	(Pungent)
Amla	(Sour)	*Tikta*	(Bitter)
Lavan	(Salty)	*Kasaya*	(Astringent)

(a) *Madhura rasa* : Pleasant, brain and heart tonic and galactogogue.

(b) *Amla rasa* : Sialagogue, appetiser and digestive.

(c) *Lavan rasa* : Readily soluble, water-retaining, softening, appetiser, digestive, sialagogue, expectorant and diuretic.

(d) *Katu rasa* : Sialagogue, appetiser, lacrimatory, produces tingling sensation on tongue and useful in dyspepsia.

(e) *Tikta rasa* : Appetiser and produces dryness in the mouth.

(f) *Kasaya rasa* : Healing of wounds, diuretic, causes stiffness and soreness of throat and dryness in mouth.

Relationship between *Rasa* and *Tridosha*

Rasa	Vāta	Pitta	Kapha
Madhura	P	P	A
Amla	P	A	A
Lavan	P	A	A
Katu	A	A	P
Tikta	A	P	P
Kasaya	A	P	P

A = Aggravates; P = Pacifies

(ii) *Vipaka* : Metabolism of the products arising out of the biochemical changes of food and drugs during the gastro-intestinal digestion.

Difference in action between Rasa and Vipaka

Rasa	Vipaka
Immediate	Delayed
Local	Systemic
Physiological and Psychological	Physiological
Perceivable	Non-perceivable, inferable

(iii) *Veerya* : Potency of a drug (therapeutic efficacy).

(a) *Sheetaveerya* : Potency which diminishes secretions, stabilises excretory functions, stops haemorrhage and increases vigour and vitality, aggravates *Vāta* and *Kapha* and subdues *Pitta*.

(b) *Ushnaveerya* : Potency leading to storing up of energy, easy digestion, diaphoresis, emesis, thirst and fatigue, subdues *Vata* and *Kapha* but excites *Pitta*.

(iv) *Prabhava* : Refers to specific and characteristic influence of a drug that cannot be explained otherwise.

(v) *Guna* (*Physical properties*) :

(a) *Guru* (Heaviness): Which can induce the feeling of heaviness, dullness and fatigue and increase the quantity of waste products and also impairs digestive functions.

(b) *Laghu*(Lightness) : Which leads to lightness (fitness) of the body and helps in digestion.

(c) *Sheeta* (Cold) : Which produces cooling effect, promotes *Vata* and *Kapha* but acts against *Pitta*, impedes blood flow and reduces syncope.

(d) *Ushna* (hot) : Which increases body temperature, induces thirst, promotes *Pitta* but acts against *Vāta* and *Kapha*, improves blood circulation, increases the amount of urine, excreta and sweat, stimulates appetite and digestive functions.

(e) *Snigdha* (Unctuous) : Which produces soothing effect on the body, acts against *Vāta* but promotes *Kapha* and eliminates waste products.

(f) *Ruksha*(Dryness) : Which induces uncomfortable feelings in the body, acts against *Kapha* but promotes *Vāta*, reduces vigour and virility and libido.

(g) *Manda* (Dullness) : Acts slowly and pacifies deranged *dosha*.

(h) *Tikshna* (Sharpness): Sharp, highly potent, removes morbidity, promotes *Pitta* and works against *Vāta* and *Kapha*.

(i) *Sthira* (stability): Which renders the physiological functions normal and regular.

(j) *Sara* (Mobility) : Which stimulates excretory system.

(k) *Mridu* (Softness): Means soft and loose on touch in relation to body tissues, stimulates *Kapha* and depresses *Vāta* and *Pitta*.

(l) *Kathina* (Hardness): Which causes stiffness and firmness of the body and excites *Vāta*.

(m) *Vishada* (Clarity): Which removes sliminess, promotes *Vāta* and heals ulcers.

(n) *Picchila* (Sliminess): Makes the objects slimy, increases body weight, promotes fracture and wound healing and stimulates excretory system.

(o) *Shlakshana* (Smoothness): Promotes tissue synthesis, increases *Kapha* and *Pitta* and stimulates formation of excretory products.

(p) *Khara* (Roughness): Leads to emaciation, retards formation of waste products and aggravates *Vāta*.

(q) *Sukshma* (Minuteness): Which penetrates through all parts of the body and stimulates *Vāta*.

(r) *Sthoola* (Bulkiness): Not easily digestible, obstructs vessels, tubes and channels of the body.

(s) *Sandra* (Solidity): Which nourishes the body.

(t) *Drava* (Fluidity): That pervades the entire body.

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PLANT SPECIES

CLASSIFICATION

FLOWERING PLANTS (ANGIOSPERMAE)

DICOTYLEDONAE

XLII. Crassulaceae

112. *Bryophyllum pinnatum* (Lam.) Oken syn. *B. calycinum* Salisb.; *Kalanchoe pinnata* (Lam.) Pers.

113. *Kalanchoe laciniata* (L.) DC. syn. *K. schweinfurthii* Penzig; *Cotyledon laciniata* L.

XLIII. Rosaceae

114. *Cydonia oblonga* Mill. syn. *C. vulgaris* Pers.

115. *Prunus domestica* L. var. *insititia* (L.) Bailey syn. *P. insititia* L.; *P. communis* Huds. var. *insititia* (L.) Hook.f.

116. *Prunus cerasoides* D.Don syn. *P. puddum* (Wall.) Roxb. ex Brandis; *Cerasus puddum* Seringe

117. *Rosa damascena* Mill.

XLIV. Leguminosae (Fabaceae)

A. *Caesalpinioideae*

118. *Bauhinia purpurea* L.

119. *Bauhinia racemosa* Lam.

120. *Bauhinia tomentosa* L.

121. *Bauhinia vahlii* Wight & Arn.

122. *Bauhinia variegata* L.

123. *Caesalpinia coriaria* (Jacq.) Willd.

124. *Caesalpinia bonduc* (L.) Roxb. syn. *C. crista* L.; *C. bonducella* (L.) Flem.; *Guilandina bonduc* L.

125. *Caesalpinia digyna* Rottl.

126. *Caesalpinia pulcherrima* (L.) Sw. syn. *Poinciana pulcherrima* L.

127. *Caesalpinia sappan* L.

128. *Cassia absus* L.

129. *Cassia alata* L.

130. *Cassia senna* L. var. *senna* Brenan syn. *C. angustifolia* Vahl

131. *Cassia fistula* L.

132. *Cassia occidentalis* L.

133. *Cassia sophera* L.

134. *Cassia tora* L.

135. *Saraca asoca* (Roxb.) de Wilde syn. *S. indica* auct. non L.

136. *Tamarindus indica* L.

B. *Mimosoideae*

137. *Acacia catechu* (L.f.) Willd.

138. *Acacia farnesiana* (L.) Willd.

139. *Acacia nilotica* Delile ssp. *indica* (Benth.) Brenan syn. *A. arabica* (Lam.) Willd. var. *indica* Benth.

140. *Acacia polyacantha* Willd. syn. *A. suma* (Roxb.) Kurz; *A. suma* Buch. - Ham. ex Voigt.

141. *Acacia tomentosa* Willd.

142. *Adenanthera pavonina* L.

143. *Albizia amara* (Roxb.) Boiv.

144. *Albizia lebbek* (L.) Benth.

145. *Entada pursaetha* DC. ssp. *pursaetha* syn. *Entada scandens* auct. non (L.) Benth.; *Entada phaseoloides* auct. non (L.) Merr.

146. *Mimosa rubicaulis* Lam.

147. *Mimosa pudica* L.

C. ***Papilionoideae***

148. *Abrus precatorius* L.

149. *Alhagi pseudalhagi* (Bieb.) Desv. syn. *A. camelorum* Fisch.; *A. maurorum* sensu Baker non Desv.; *Hedysarum pseudalhagi* Bieb.

150. *Arachis hypogaea* L.

151. *Astragalus candolleanus* Royle ex Benth. syn. *A. anomalus* Bunge

152. *Butea monosperma* (Lam.) Taub. syn. *B. frondosa* Koenig ex Roxb.; *Erythrina monosperma* Lam.

153. *Butea superba* Roxb.

154. *Cajanus cajan* (L.) Millsp. syn. *C. indicus* Spreng.; *C. obcordifolia* Singh; *Cytisus cajan* L.

155. *Cicer arietinum* L.

156. *Clitoria ternatea* L.

157. *Crotalaria juncea* L.

158. *Crotalaria verrucosa* L.

159. *Dalbergia sissoo* Roxb.

160. *Derris trifoliata* Lour. syn. *D. uliginosa* Benth.; *Robinia uliginosa* Willd.

161. *Desmodium gangeticum* (L.) DC. syn. *Hedysarum gangeticum* L.

162. *Dolichos biflorus* L.

163. *Dolichos lablab* L.

164. *Erythrina variegata* L. var. *orientalis* (L.) Merr. syn. *E. indica* Lam.; *E. mysorensis* Gamble

165. *Glycine max* (L.) Merr. syn. *G. soja* sensu Baker; *Phaseolus max* L.; *Dolichos soja* L.

166. *Glycyrrhiza glabra* L.

167. *Indigofera linifolia* Retz.

168. *Indigofera tinctoria* L.

169. *Lathyrus sativus* L.

170. *Lens culinaris* Medic. syn. *L. esculenta* Moench; *Ervum lens* L.

171. *Melilotus indica* (L.) All. syn. *M. parviflora* Desf.; *Trifolium indica* L.

172. *Mucuna pruriens* (L.) DC. syn. *M. prurita* Hook.

173. *Ougeinia oojeinensis* (Roxb.) Hochr. syn. *O. dalbergioides* Benth.

174. *Pisum sativum* L. syn. *P. arvense* L.

175. *Pongamia pinnata* Pierre syn.*P. glabra* Vent.

176. *Prosopis cineraria* (L.) Druce syn. *P. spicigera* L.; *Mimosa cineraria* L.

177. *Psoralea corylifolia* L.

178. *Pterocarpus marsupium* Roxb.

179. *Pterocarpus santalinus* L.f.

180. *Sesbania grandiflora* Pers.

181. *Sesbania sesban* (L.) Merr. syn. *S. aegyptiaca* (Poir.) Pers.; *Aeschynomene sesban* L.

182. *Tephrosia purpurea* (L.) Pers. syn. *T. hamiltonii* Drumm ex Gamble; *Cracca purpurea* L.

183. *Tephrosia villosa* Pers.

184. *Teramnus labialis* Spreng.

185. *Trigonella foenum-graecum* L.

186. *Uraria lagopodioides* Desv. syn. *U. lagopoides* DC.

187. *Uraria picta* (Jacq.) Desv. ex DC. syn. *Hedysarum pictum* Jacq.

188. *Vigna mungo* (L.) Hepper syn. *Phaseolus mungo* (L.) Mant.

189. *Vigna trilobata* (L.) Verdcourt syn. *Phaseolus trilobatus* (L.) Schreb.; *P. trilobus* sensu Ait.; *Dolichos trilobatus* (L.) Mant.

XLV. Bixaceae

190. *Bixa orellana* L.

XLVI. Tamaricaceae

191. *Tamarix dioica* Roxb.

192. *Tamarix troupii* Hole syn. *T. gallica* auct. non L.

XLVII. Caricaceae

193. *Carica papaya* L.

XLVIII. Theaceae

194. *Schima wallichii* Choisy.

XLIX. Dipterocarpaceae

195. *Dipterocarpus costatus* Gaertn. f. syn. *D. alatus* sensu Dyer; *D. angustifolius* W. & A.

196. *Dipterocarpus turbinatus* Gaertn.f.

197. *Shorea robusta* Gaertn.f.

L. Dilleniaceae

198. *Dillenia indica* L.

LI. Flacourtiaceae

199. *Casearia tomentosa* Roxb.

200. *Flacourtia jangomas* (Lour.) Raeusch. syn. *F. cataphracta* Roxb. ex Willd.; *Stigmarota jangomas* Lour.

201. *Flacourtia indica* (Burm.f.) Merr. syn. *F. ramontchi* L'Herit; *F. latifolia* Cooke; *F. occidentalis* Blatter

202. *Flacourtia sepiaria* Roxb.

203. *Gynocardia odorata* R.Br.

204. *Hydnocarpus kurzii* (King) Warb. syn. *H. heterophyllus* Kurz; *Taraktogenos kurzilf* King

205. *Hydnocarpus laurifolia*(Dennst.) Sleumer syn. *H. wightiana* Blume; *Munnicksia laurifolia* Dennst.

LII. Violaceae

206. *Hybanthus enneaspermus* (L.) F. Muell. syn. *Ionidium suffruticosum* (L.) R. & S.; *I. enneaspermum* (L.) Vent.; *Viola enneasperma* L.; *V. suffruticosa* L.

LIII. Guttiferae (Clusiaceae)

207. *Calophyllum inophyllum* L.

208. *Garcinia mangostana* L.

209. *Garcinia morella* (Gaertn.) Desr.

210. *Garcinia xanthochymus* Hook.f. & T. And. syn. *G. tinctoria* Dunn; G. pictorius (Roxb.) A. Arcy; *Xanthochymus pictorius* Roxb.; *X. tinctorius* DC.

211. *Mammea suriga* (Buch.-Ham. ex Roxb.) Kost syn. *Mammea longifolia* Planch. ex Triana; *Ochrocarpus longifolius* Benth. & Hook.f.

212. *Mesua ferrea* L.

LIV. Tiliaceae

213. Corchorus capsularis L.

214. *Corchorus olitorius* L.

215. *Elaeocarpus sphaericus* (Gaertn.) K. Schum. syn. *E. ganitrus* Roxb.; *Ganitrus sphaericus* Gaertn.

216. *Grewia subinaequalis* DC. syn. *G. asiatica* L.; *G. hainesiana* Hole

217 *Triumfetta rhomboidea* Jacq. syn. *T. bartramia* L.

LV. Malvaceae

218. *Abelmoschus esculentus* (L.) Moench syn. *Hibiscus esculentus* L.

219. *Abelmoschus moschatus* Medic. syn. *Hibiscus abelmoschus* L.

220. *Abutilon indicum* (L.) Sw. syn. *A. asiaticum* (L.) Sw.; *Sida guineensis* Schumach.

221. *Abutilon theophrasti* Medic. syn. *A. avicennae* Gaertn.

222. *Gossypium herbaceum* L. syn. *G. obtusifolium* Roxb. (in part); *G. wightianum* Tod.

223. *Hibiscus cannabinus* L.

224. *Hibiscus rosa-sinensis* L.

225. *Pavonia odorata* Willd.

226. *Sida cordifolia* L.

227. *Sida rhombifolia* L. var. *rhombifolia*; *S. rh.* var. *rhomboidea* (Roxb.) Mast.

228. *Sida alba* L. syn. *S. spinosa* L.

229. *Sida cordata* (Burm.f.) Borssum syn. *S. veronicaefolia* Lam.; *S. humilis* Cav.

230. *Thespesia populnea* Soland. ex. Corr.

231. *Urena lobata* L.

DESCRIPTION AND DISCUSSION

XLII. Crassulaceae

112. *Bryophyllum pinnatum* (Lam.) Oken
syn. *B. calycinum* Salisb.; *Kalanchoe pinnata* (Lam.) Pers.

Vernacular Names : Sans : *Pashanabheda*; Hind : *Patharchur*; Beng : *Patharkunchi*; Tam : *Runakalli*.

पाषाणभेदो मधुरस्तिक्तो मेहविनाशनः ।
तृद्दामूत्रकृच्छ्घ्नः शीतलश्चाश्मरीहरः ।।
(राजनिघण्टु)

pāṣāṇabhēdō madhuraastiktō mēhavināśana: .
tṛdadāmūtrakṛcchghna: śītalaścāśmarīhara: ..
(rājanighaṇṭu)

It is *madhura*, *tikta*; cures polyuria; allays thirst, alleviates burning sensation and dysuria; *sheetala* (*sheetaveerya*); heals urinary calculi.

Occurrence & Distribution : Throughout the hot and moist parts of India; common in West Bengal.

Description : Glabrous herb, with stems 30.5-121.9 cm in height. Leaves (succulent) crenate, 7.6-15.2 cm long. Flowers pendulous, 5.1 cm long. Sepals united in a long inflated calyx. Petals united in a campanulate tube, lobes short. The receptacle of flower looks like a cup with green, red and white spots and dentate at the margin. The plant spreads by vegetative propagation and new plants arise from the crenulations of any leaf that comes into contact with the soil.

Flowers in winter and fruits in summer.

Part Used: Leaves.

Therapeutic Uses : *Leaves* : externally applied after toasting in the treatment of bruises, boils and bites of venomous insects; poultice or powder applied to sloughing ulcers.

Chemical Constituents : It contains *n*-alkanes (C_{25}-C_{35}), the major products being *n*-hentriacontane and *n*-triacontane, *n*-primary alcohols (C_{27}-C_{34}); α- and β-amyrins and β-sitosterol; fumaric, malic, isocitric, citric, *p*-hydroxybenzoic, *p*-hydroxycinnamic, 4-hydroxy-3- methoxy cinnamic, *p*-coumaric, syringic and caffeic acids, quercetin, quercetin-3- diarabinoside, quercetin-3-L- rhamnoside-L-arabinofuranoside, kaempferol, kaempferol-3-glucoside and 3,8-dimethoxy-4′,5,7-trihydroxy- flavone (*Wlth India*, 1948, **1**, 233, CSIR, New Delhi; *Khim, Prir. Soedin*, 1969, **5**, 597; *Chem. Abstr.*, 1970, **73**, 84621; *Planta med.*, 1971, **20**, 368; *Phytochemistry*, 1972, **11**, 1500; *Planta med.*, 1973, **23**, 149; *ibid.*, 1974, **25**, 193; *Medicinal Plants of India*, ed. G.V. Satyavati, *et al*, 1976, **1**, 150, ICMR, New Delhi).

113. *Kalanchoe laciniata* (L.) DC. syn. *K. schweinfurthii* Penzig; *Cotyledon laciniata* L.

Vernacular Names : Sans : *Vatapatri*; Hind & Beng : *Hemsagar*; Tam : *Malakalli*.

वटपत्री हिमा गौल्या मेह कृच्छ्रविनाशिनी ।
वलदा व्रणहन्त्री च किञ्चित् दीपनकारिणी ।।

(राजनिघण्टु)

vaṭapatrī himā gaulyā mēha kṛcchravināśinī .
valadā vraṇahantrī ca kiñcit dīpanakāriṇī ..
(rājanighaṇṭu)

It is *hima* (*sheetaveerya*), causes obesity; *gaulya* (*madhura*); beneficial in polyuria and dysuria; invigorating; cures ulcer and mild gastric stimulant.

Occurrence & Distribution : Found in Bihar, West Bengal and in the hilly regions of Southern India up to an elevation of 914 m.

Description : An erect stout perennial herb. Leaves large, variable, crenate-obovate. Flowers borne in paniculate cymes, magenta or yellow-orange. Sepals united in a short tubular calyx, standing apart at the base. Petals united in an urceolate tube, with spreading limbs.

Flowers in rainy season and fruits in winter.

Part Used : Leaves.

Therapeutic uses : *Leaves* : roasted or crushed applied to wounds, cuts, abrasions, ulcers, bites of venomous insects and gnats; juice internally administered in diarrhoea, dysentery, lithiasis and tuberculosis.

XLIII. Rosaceae

114. *Cydonia oblonga* Mill. syn. *C. vulgaris* Pers.

Vernacular Names : Sans : *Patala*; Hind : *Bihi*; Beng : *Bihidana*; Tam : *Shimaimathala*; Eng : Quince.

पाटला पिच्छिला प्रोक्ता सा स्निग्धा कासवारिणी ।
शिश्नयोन्योहरेद्दाहं व्रणदाहनिवारणी ।।

(द्रव्यगुण)

pāṭalā picchilā prōktā sā snigdhā kāsavāriṇī .
śiśnayōnyōharēdadāhaṃ vraṇadāhanivāraṇī ..

(dravyaguṇa)

It is known to be *picchila*, *snigdha*, antitussive; cures balanitis and vaginitis; relieves burning sensation due to ulcer.

Occurrence & Distribution : Grown in Kashmir, Himachal Pradesh and the Nilgiris at an altitude of 1700 m.

Description : A shrub or small tree, rather bushy. Bark black. Leaves simple, entire; stipules oblique, ovate. Flowers solitary, white or pink, woolly, large. Fruit subglobose (like an apple), intruded at the apex and base, fleshy and firm, fragrant, 5-celled; cells many-seeded.

Flowers and fruits from March to May.

Parts Used : Fruits, seeds and mucilage.

Therapeutic Uses : *Fruits* : Astringent, refrigerant, expectorant and cardiac tonic; *seeds* : demulcent; used against fever, sore-throat, gonorrhoea, diarrhoea and dysentery with inflammation of the mucous membrane; *mucilage* : expectorant; externally applied in ulcers, burns and scalds.

Chemical Constituents : Malic, tartaric, oleic, linoleic, palmitic, linolenic and ursolic acids; roseoside, *n*-paraffins, β-sitosterol, saringosterol, uvaol have been reported in addition to amygdalin, a cyanogenetic glycoside, rutin and tannin (*Wlth India*, 1950, **2**, 410, CSIR, New Delhi; *Glossary of Indian Medicinal Plants*, ed. R.N. Chopra *et al*, 1956, 86, *ibid.*, (Suppl.), 1969, 21, CSIR, New Delhi; *Khim. Prir. Soedin.*, 1976, **12**, 399; *Chem. Abstr.*, 1976, **85**, 139719; *Phytochemistry*, 1976, **15**, 1990; *Agric. Biol. Chem.*, 1978, **42**, 1589; *Chem. Abstr.*, 1978, **89**, 160177).

115. *Prunus domestica* L. var. *insititia* (L.) Bailey
syn. *P. insititia* L.; *P. communis* Huds. var. *insititia* (L.) Hook. f.

Vernacular Names : Sans : *Aruka*; Hind & Beng : *Alubokhra*; Tam : *Alpagada-punjam*; Eng : Common plum.

आरुकं वीरसेनञ्च वीरं वीरारुकं तथा ।
तच्च विद्याच्चतुर्जातीः पत्रपुष्पादिभेदतः ।।
आरुकानि च सर्वाणि मधुराणि हिमानि च ।।
अर्शः प्रमेहगुल्मास्रदोषविध्वंसनानि च ।।

(राजनिघण्टु)

ārukaṃ vīrasēnañca vīraṃ vīrārukaṃ tathā .
tacca vidyāccaturjātīḥ patrapuṣpādibhēdataḥ ..
ārukāni ca sarvāṇi madhurāṇi himāni ca ..
arśaḥ pramēhagulmāsradōṣavidhvaṃsanāni ca ..

(rājanighaṇṭu)

All the varieties* of the common plum are *madhura*, *hima*(*sheetaveerya*); cures piles, polyuria, abdominal lump and dyscrasia.

Occurrence & Distribution : Cultivated from Garhwal to Kashmir at an altitude of 1,524-2,134 m; also found in Himachal Pradesh.

Description : A shruby plant, spinous or unarmed. Leaves obovate, ovate or ovate-lanceolate, serrulate, obtuse-acute or cuspidate; nerves hairy beneath. Stipules linear, fimbriate. Flowers on slender pedicels, 3 or 4 times the length of calyx-tube. Drupe globose or ovoid, borne singly or in pairs.

Flowers in December-January and fruits in February-March.

Parts Used : Fruits and root.

Therapeutic Uses : *Fruits* : laxative, refrigerant, refreshing and anabolic; effective in the treatment of enlarged spleen, piles, leucorrhoea, irregular menstruation and gonorrhoea; *roots* : astringent.

Chemical Constituents : It contains β-carotene, cryptoxanthin, lutein, violaxanthin, neoxanthin, persicaxanthin, persicachrome, apo-12′-violaxanthal, apocarotenal, 2-apocarotenol, 5,6-epoxy-3-hydroxy-5,6-dihydro-12′-apo-β-caroten-12′-al, 5,7-dihydroxy-4′-methoxy-dihydroflavonol, 5,7-dihydroxy-8,4′-

* According to Ayurveda, four varieties of this species are known differing in morphology of their leaves and flowers.

demethoxyflavonol, kaempferol, dihydrokaempferol, rutoside, quercetin-3-rhamnoglucoside, leucoanthocyanidin, pinocembrin, isosakuranetin, chrysin, naringenin, quercetin, kaempferide, aromadendrin, 4-O-methyl-2-O-β-D-glucopyranosyl-phloracetophenone, phloracetophenone-4-methylether, phloracetophenone, 5,7-dimethoxy-6-hydroxycoumarin (fraxinol), *p*-cymene-8-ol, γ-dodecalactone, lauric, myristic, palmitic, stearic, arachidic, oleic, linoleic acids, thiamine, lecithin, sugars, protein, carbohydrates, benzoic acid, terpenoids and the alkaloid, noradrenaline (*C.R. Acad. Sci. Paris. Ser D.*, 1959, **249**, 2423, 2866; *Chem. Abstr.*, 1960, **54**, 12378, 13282; *Wlth India*, 1969, **8**, 271, CSIR, New Delhi; *Gartenbauwissenschaft*, 1984, **49**, 18; *Chem. Abstr.*, 1984, **101**, 3901; *Parfums Cosmet Aromes.*, 1985, **62**, 69; *Chem. Abstr.*, 1985, **103**, 121966; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, **2**, 511, ICMR, New Delhi; *An Asoc. Quim Argent.*, 1987, **75**, 531; *Chem. Abstr.*, 1988, **109**, 54938; *Dictionary of Alkaloids*, ed. I.W. Southon and J. Buckingham, 1989, 766, Chapman and Hall Ltd., London).

116. *Prunus cerasoides* D. Don syn. *P. puddum* (Wall.) Roxb. ex Brandis; *Cerasus puddum* Seringe

Vernacular Names : Sans & Beng : *Padmak*; Hind : *Paddam*; Eng : Himalayan wild cherry.

padmakaṃ tuvaraṃ tiktaṃ śītalaṃ vātalaṃ laghu .
visarpadāhavisphōṭakuṣṭhaślēṣmāsrapittanut ..
garbhasaṃsthāpanaṃ rucyaṃ vamivraṇatṛṣāpraṇut ..
(bhāvaprakāśa)

पद्मकं तुवरं तिक्तं शीतलं वातलं लघु ।
विसर्पदाहविस्फोटकुष्ठश्लेष्मासृपित्तनुत् ।।
गर्भसंस्थापनं रुच्यं वमिव्रणतृषाप्रणुत् ।।
(भावप्रकाश)

It is *tuvara* (*kashaya*), *tikta*, sheetala (*sheetaveerya*); excites *vata*, *laghu*; beneficial in erysepelas, burning sensation, boils, skin diseases, deranged *sleshma* and haemorrhagic diseases; prevents abortion; appetizing; anti-emetic; heals ulcer and allays thirst.

Occurrence & Distribution : Wild and cultivated in the temperate Himalayan region from Kashmir to the North eastern part of India up to an elevation of 900-2,500 m.

Description : A large tree. Leaves ovate or oblong-lanceolate, caudate-acuminate, sharply serrate. Flowers rose-red or white; peduncle long.

Drupe ellipsoid or oblong, acute at both ends; pulp very little, yellow or slightly red.

Flowers in March-May (var. *rubeus*) and October-November (var. *majestica*) and fruits in May-June and November- December, respectively.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : kernel used in the treatment of stone and gravel in the kidney.

Chemical Constituents : Seeds yield naringenin-5-O- α-L-rhamnopyranoside and 4′-O-methylliquiritigenin-7-O-α-L-rhamnopyranoside. The heartwood contains dihydrotectochrysin, tectochrysin, dihydrowogonin, pinocembrin, sakuranetin, chrysin, naringenin, kaempferol, aromadendrin, quercetin, taxifolin, 7-hydroxy- 5,2′,4′-trimethoxyflavanone, padmatin and its precursor, taxifolin, 2′-hydroxy-2,4,4′,6′-tetramethoxychalcone and 2′,4′-dihydroxy-2,4,6′-trimethoxy-chalcone. The stem-bark contains β-sitosterol behenate, tectochrysin, genistein and its 4′-glucoside, sakuranetin (5,4′-dihydroxy-7-methoxy flavone) and its 5-glucoside, genkwanin, prunetin, padmakastein (hydroprunetin) and its 4′-glucoside, neosakuranin (2,4′-dihydroxy-4-methoxy-6-glucosidoxy chalcone) and leucocyanidin (*Indian J. Chem.*, 1969, 7, 43; *Wlth India*, 1969, 8, 266, CSIR, New Delhi; *Medicinal Plants of India*, ed, S.V. Satyavati *et al*, 1987, 2, 510, ICMR, New Delhi).

117. *Rosa damascena* Mill.

Vernacular Names : Sans : *Shatapatri*; Hind : *Gulab*; Beng : *Golap*; Tam : *Trose*; Eng : Damask rose.

शतपत्री हिमा तिक्ता कषाया कुष्ठनाशनी ।
मुखस्फोटहरा रुच्या सुरभिः पित्तदाहनुत् ।।
(राजनिघण्ट)

śatapatrī himā tiktā kaṣāyā kuṣṭhanāśanī .
mukhasphōṭaharā rucyā surabhi: pittadāhanut ..
(rājanighaṇṭu)

It is *hima* (*sheetaveerya*), *tikta*, *kashaya*; efficacious in the treatment of skin diseases and acne vulgaris; appetizing; aromatic and beneficial in burning sensation and deranged *pitta*.

Occurrence & Distribution : Widely grown in gardens throughout India.

Description : An erect shrub, up to 2 m in height. Branches long, arching, with large hooked prickles. Leaves pinnate; leaflets 3- 7; stipules adnate. Flowers several, arranged in a corymb, double, pink, red or white, borne on glandular-hispid and prickly pedicels, sweet-scented. Fruit obovate or ovoid, bristly, pulpy, bright red.

Flowers in June-July extending over several months and fruits rare.

Part Used : Flowers.

Therapeutic Uses : *Flowers* : astringent and tonic (*gulcand*, a preparation from equal parts of sugar and petals); rose-water from flowers used as a vehicle for medicine; *buds* : astringent, cardiotonic, expectorant and laxative.

Chemical Constituents : The flowers contain essential oils : citronellol, nerol, geraniol, β-phenylethanol and its glucoside, eugenol and methyl eugenol; organic acids, chlorogenic acid, tannin, cyanin, cyanidin and its 3,5-diglucoside, quercitrin, carotene and sugars. Lycopene, rubixanthin, zeaxanthin, xanthophyll and taraxanthin have been isolated from the hips. Long chain conjugated alkadienes, stigmasterol, β-sitosterol, 3-epidehydroabietic acid, 6-methyl-5-hepten-2-one, pectolinarigenin, quercetin, kaempferol and its 3-O-β-D-glucopyranoside and 3-O-β-D-galactoside, α,β and δ-damascones are reported from the plant (*Rasteniev'd Nauki*, 1967, **4**, 19; *Chem. Abstr.*, 1968, **68**, 75745; *Chem Ind., 1967, 954; Ann. Pharm. Fr.*, 1969, **27**, 433; *Chem. Abstr.*, 1970, **72**, 63578;

Phytochemistry, 1971, **10**, 2525; *Wlth India*, 1972, **9**, 67, CSIR, New Delhi; *Riv. Ital. Essenze. Profumi, Planta Off., Aromi, Saponi, Cosmet, Aerosol*, 1975, **57**, 216; *Chem. Abstr.*, 1975, **83**, 11141; *J. chem. Soc. Perkin Trans I*, 1975, 1727; *Dokl., Akad. Nauk SSSR*, 1975, **223**, 1260; *Chem. Abstr.*, 1976, **84**, 2203; *Khim. Prir. Soedin.*, 1982, 783; *Chem. Abstr.*, 1983, **98**, 104318; *Nauchni Tr. Plovdivski Univ.*, 1984, **22**, 221; *Chem. Abstr.*, 1986, **105**, 94467).

XLIV. Leguminosae (Fabaceae)

(A) *Caesalpinioideae*

118. *Bauhinia purpurea* L.

Vernacular Names : Sans : *Kovidara**; Hind : *Khairwal*; Beng : *Devakanchan*; Tam : *Mandari*; Eng : Butterfly tree.

कविदारोपि तद्वत्स्यात्तयोः पुष्पं लघु स्मृतम् ।
रुक्षं संग्राहि पित्तासप्रदरक्षयकासनुत् ॥
(भावप्रकाश)

kavidārōpi tadvatsyāttayōḥ puṣpaṃ laghu smṛtam .
rukṣaṃ saṅgrāhi pittāsrapradarakṣayakāsanut ..
(bhāvaprakāśa)

The properties of this plant resemble those of *Bauhinia variegata*. Flowers are *laghu* but *ruksha*, astringent; beneficial in haemorrhagic diseases, leucorrhoea and cough.

Occurrence & Distribution : Lower slopes of the Himalayas; also distributed in Assam, Khasi hills and the western Peninsula; occasionally cultivated in gardens for its large coloured flowers.

Description : A moderate-sized ornamental evergreen tree. Bark brown, 1.3 cm thick. Wood moderately soft, greyish-brown. Leaves rigidly sub-coriaceous, 2-lobed, not deeply cleft. Flowers pink, appearing with leaves in terminal panicles. Calyx-limb irregularly 3-5 cleft. Fertile stamens 3 or 4. Pods long, narrow, flat, firm, dehiscent. Seeds 12-15.

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* Though *Wlth India, Raw Materials*, 1988, **2B**, 56, assigns the name *Kavidara* to ***Bauhinia variegata*** (No. 122) we followed *Bhavaprakasa* according to which *Kavidara* was earlier considered to be a group of plant species of the genus ***Bauhinia*** having similar therapeutic properties.

112. *Bryophyllum pinnatum* (Lam.) Oken

116. *Prunus cerasoides* D.Don

117. *Rosa damascena* Mill.

118. *Bauhinia purpurea* L.

119. *Bauhinia racemosa* Lam.

126. *Caesalpinia pulcherrima* (L.) Sw.

129. *Cassia alata* L.

Flowers in September-December and fruits in winter and summer.

Parts Used : Flowers, bark and root.

Therapeutic Uses : *Flowers* : laxative; *buds* (dried) : anthelmintic, useful in piles and blood dysentery; *bark* : in diarrhoea; *root-bark* : mixed with curd found efficacious in haemorrhoids while its paste with dried ginger applied internally in the treatment of goitre; *root* : carminative.

Chemical Constituents : Flowers contain quercetin, astragalin, isoquercitrin, kaempferol-3-glucoside, pelargonidin-3-glucoside and 3-triglucoside. Isolation of 3,4-dihydroxychalcone-4-O- β-L-arabinopyranosyl-O-β- D-galactopyranoside and butein-4′-O- β-L-arabinopyranosyl-O-β-D-galactoside and phytohaemagglutinin, a trypsin inhibitor, and presence of amino acids and alkaloids have been reported from the seeds. Anthocyanin, rutin, apigenin, apigenin-7-O-glucoside also occur in the plant (*Curr. Sci.*, 1967, **36**, 574; *Wlth India.*, 1988, **2B**, 54, CSIR, New Delhi; *Herba Hung*, 1987, **26**, 27; *Chem. Abstr.*, 1987, 107, 151201).

119. *Bauhinia racemosa* Lam.

Vernacular Names : Sans : *Kovidara, Swetakanchan*; Hind : *Ashta*; Beng : *Banaraj*; Tam : *Arai.*

कोविदारः कषायः स्यात् संग्राही व्रणरोपनः ।
दीपनः कफवातघ्नो मूत्रकृच्छ्रनिवारणः ॥
(राजनिघण्टु)

kōvidāraḥ kaṣāyaḥ syāt saṅgrāhī vraṇarōpanaḥ .
dīpanaḥ kaphavātaghnō mūtrakṛcchranivāraṇaḥ ..
(rājanighaṇṭu)

The plant is *kashaya*; astringent; heals ulcer; gastric stimulant, subdues deranged *kapha* and *vata* and beneficial in dysuria.

Occurrence & Distribution : Occurs throughout India.

Description : A small, crooked, bushy tree with drooping branches. Leaves broader than long, rigidly coriaceous, 3.8-5.1 cm long. Flowers whitish-yellow, short peduncled, in lax, terminal and leaf-opposed racemes. Calyx with a short tube. Fertile stamens 10. Pods falcate, neither beaked nor venulose, indehiscent, 2.5 cm wide. Seeds 12-20, dark reddish-brown.

Flowers in rainy season, winter, autumn and fruits in winter.

Parts Used : Leaves and bark.

Therapeutic Uses : *Leaves* : effective in malaria; *bark* : astringent; beneficial in dysentery.

Chemical Constituents : β-Amyrin, β-sitosterol, octacosane, pacharin, racemosal and the fatty acid composition of the seed oil and amino acids from seeds have been reported (*Curr. Sci.*, 1976, **45**, 705; *J. Sci. Res.*, (Bhopal, India), 1980, **2**, 133; *Tetrahedron*, 1984; **40**, 4245; *ibid.*, 1986, **42**, 2417; *Wlth India*, 1988, **2B**, 55, CSIR, New Delhi).

120. *Bauhinia tomentosa* L.

Vernacular Names : Sans : *Pitakanchana*; Hind & Beng : *Kachnar*; Tam : *Iruvaji*; Eng : St. Thomas tree.

Occurrence & Distribution : Found throughout India.

Description : An erect shrub with downy branches. Leaves broader than long coriaceous, pubescent below. Flowers usually in axillary pairs, pendent and half open, yellow, with a maroon dot at the base of central petal. Pods narrow, stalked, not ribbed near the upper suture. Seeds 6-10, small.

Flowers in rainy season and fruits in winter.

Parts Used : Fruits, flowers, leaves and root.

Therapeutic Uses : *Fruits* : diuretic; *Flowers, buds* and *leaves* (dried) : in dysentery; *root- bark* : beneficial in inflammation of liver.

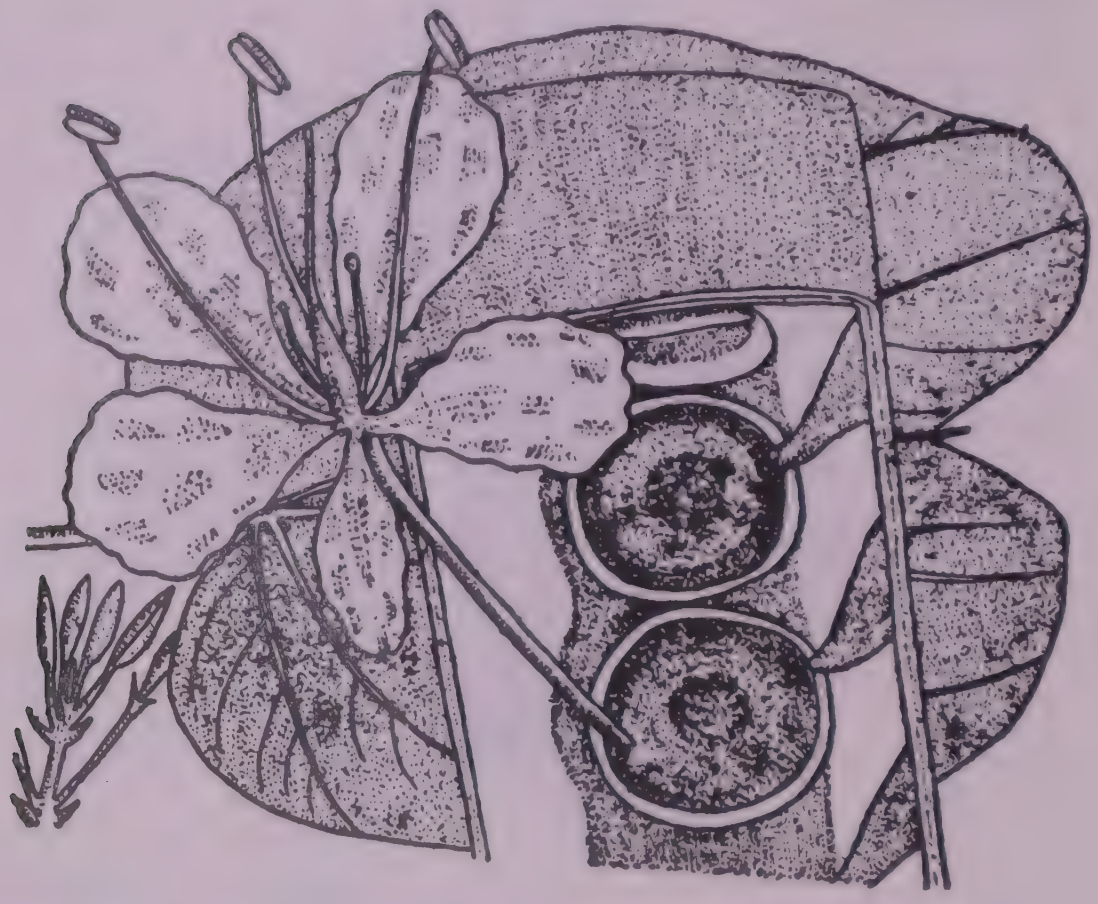
Chemical Constituents : Flowers contain rutin, isoquercitrin and quercetin. Plant contains aspartic acid, glutamic acid and octadecadienoic acid (*Indian J. Chem.*, 1963, **1**, 450; *Fitoterapia*, 1983, **54**, 257; *Fette-Seifen- Anstrichem.*, 1984, **86**, 237; *Chem. Abstr.*, 1984, **101**, 71296).

121. *Bauhinia vahlii* Wight and Arn.

Vernacular Names : Hind : *Maljan*; Beng : *Chehur*; Eng : Camel's foot climber.

Occurrence & Distribution : Assam, Bihar, Madhya Pradesh and Punjab.

Description : A huge climber with densely pubescent branchlets and copious circinnate tendrils. Leaves broader than long, rigidly subcoriaceous, deeply cordate, 11-13 nerved with obtuse lobes, densely pubescent beneath. Flowers borne in dense subcorymbose racemes, white. Calyx-tube elongated, limb 2-cleft. Fertile stamens 3. Pods flat (22.9-45.7 cm x 5.1-7.6 cm), subligneous, dehiscent.



Flowers in April and fruits in winter.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : aphrodisiac and tonic; *leaves* : demulcent and mucilagenous.

Chemical Constituents : Isolation of the glycosides of quercitol and kaempferol, quercitroside, isoquercitroside, rutoside, α-taxifoline rhamnoside; agathioflavone and its mono- and di-O-methyl derivatives; kaempferol, quercetin, betulinic acid, tannins and proteins has been reported (*Plant. med. Phytother.*,1977, **11**, 213; *Forage Res.*, 1979, **5**, 109; *Chem. Abstr.*, 1981, **94**, 136147; *J. Indian chem. Soc.*, 1985, **62**, 337).

122. *Bauhinia variegata* L.

Vernacular Names : Sans & Hind : *Kanchanara*; Beng : *Rakta kanchan*; Tam : *Segapumanchori*

काञ्चनारो हिमो ग्राही तुवरः श्लेष्मपित्तनुत् ।
कृमिकुष्ठगुदभ्रंशगण्डमालाव्रणापहः ॥

(भावप्रकाश)

kāñcanāro himo grāhī tuvara: ślēṣmapittanut .

krmikuṣṭhagudabhraṃśaganḍamālāvraṇāpaha: ..

(bhāvaprakāśa)

The plant is *hima* (*sheetaveerya*), astringent, *tuvara* (*kashaya*), beneficial in deranged *pitta* and *sleshma* (*kapha*); anthelmintic; applied to skin diseases; used in the treatment of prolapse rectum, scrofula; cures ulcer.

Occurrence & Distribution : In the sub-Himalayan tract from the Indus eastwards; also found in the dry forests of Central, Eastern and Southern India.

Description : A medium-sized erect, deciduous tree. Bark grey, with longitudinal cracks, light-pink inside. Wood moderately hard, greyish-brown. Leaves 1-foliolate, 2-lobed, not deeply cleft, rigidly subcoriaceous, deeply cordate. Flowers variously coloured, sessile or borne in short peduncled corymbs. Calyx-tube elongated; limb entire, spathaceous. Pods flat, hard, long, curved, compressed, dehiscent. Seeds 10-15.

Flowers in March and fruits in rainy season.

Parts Used : Flowers, bark and root.

Therapeutic Uses : *Flowers* and *buds* (dried) : anthelmintic; efficacious in diarrhoea, piles and dysentery; *bark* : tonic, astringent and anthelmintic; an emulsion of the powder with rice-water mixed with ginger used in scrofula and cutaneous affections; *root* : decoction—carminative and used in dyspepsia and flatulence.

Chemical Constituents : 5,7-Dihydroxy- and 5,7-dimethoxy-flavanone-4-O-α-L-rhamnopyranosyl-β-D-glucopyranosides, kaempferol-3-glucoside, lupeol and β-sitosterol have been isolated from the stem. Quercitroside, isoquercitroside, rutoside, α-taxifoline rhamnoside, myricetol glycoside, apigenin-7-O-glucoside, quercetin, rutin, apigenin; ascorbic, aspartic, glutamic, octadecanoic acids, keto- and amino acids and tannins have also been reported. 3-glucosides of peonidin and cyanidin, malvidin and peonidin, 3-di-glucosides of malvidin obtained from the pale violet flowers while the white flowers contain 3-galactoside and 3-rhamnoglucoside of kaempferol (*J. Indian Bot. Soc.*, 1975, **54**, 207; *Phytochemistry*, 1976, **15**, 835; *Pakist. J. sci. industr Res.*, 1977, **20**, 384; *Plant med. Phytother.*, 1977, **11**, 213; *Indian J. Chem.*, 1979, **18B**, 85; *Planta med.* 1980, **38**, 174; *Indian J. Anim. Sci.*, 1980, **50**, 881; *ibid.*, 1983, **53**, 1033; *Fitoterapia*, 1983, **54**, 257; *Fette-Seifen-Anstrichem.*, 1984, **86**, 237; *Chem. Abstr.*, 1984, **101**, 71296; *Nat. Acad. Sci. Lett.* (India), 1984, **7**, 15; *J. Indian chem. Soc* .,1985, **62**, 693; *Herba Hung.*, 1987, **26**, 27; *Chem. Abstr.*, 1987, **107**, 151201).

123. *Caesalpinia coriaria* (Jacq.) Willd.

Vernacular Names : Beng : *Tauri*; Tam : *Tividivi*; Eng : American sumac.

Occurrence & Distribution : Grows abundantly in South India; also cultivated in West Bengal and Northwest India.

Description : A small unarmed tree. Leaves bipinnate. Flowers yellow, several, borne in a single peduncle. Pods smooth, fleshy, spirally twisted, pale or blackish-brown, 5.1-7.6 cm long, 1.9 cm broad and 0.3 cm thick.

Flowers from September to November and fruits in December.

Parts Used : Pods and bark.

Therapeutic Uses : *Pods* : astringent, antiperiodic and tonic; decoction in the treatment of haemorrhoids; *bark* : antiperiodic; beneficial in chronic fever.

124. *Caesalpinia bonduc* (L.) Roxb.
syn. *C. crista* L.; *C. bonducella* (L.) Flem.; *Guilandina bonduc*. L.

Vernacular Names : Sans : *Putikaranja*; Hind : *Kat-karanja*; Beng : *Nata*; Tam : *Kazhichikay*; Eng : Fever nut.

करञ्जः कटुकस्तीक्ष्णो वीर्योष्णो योनिदोषहृत् ।
कुष्ठोदावर्त्तगुल्मार्शोव्रणक्रिमिकफापहः ॥
तत् पत्रं कफवातार्शः क्रिमिशोथहरं परम् ।
भेदनं कटुकं पाके वीर्योष्णं पित्तलं लघु ॥
तत्फलं कफवातघ्नं मेहार्शः क्रिमिकुष्ठजित् ॥

(द्रव्यगुण)

karañjaḥ kaṭukastīkṣṇō vīryōṣṇō yōnidōṣahṛt .
kuṣṭhōdāvarttagulmārśōvraṇakrimikaphāpahaḥ ..
tat patraṃ kaphavātārśaḥ krimiśōthaharaṃ param .
bhēdanaṃ kaṭukaṃ pākē vīryōṣṇaṃ pittalaṃ laghu ..
tatphalaṃ kaphavātaghnaṃ mēhārśaḥ krimikuṣṭhajit ..

(dravyaguṇa)

It is *katu*, *teekshna*, *ushnaveerya*; beneficial in gynaecological disorders, skin diseases, constipation, abdominal lump, piles, ulcer, worms and deranged *kapha*. Leaves are beneficial in deranged *kapha*, *vata*, piles, worms and oedema; laxative, *katuvipaka*, *ushnaveerya*, aggravates *pitta*; *laghu*. Fruits cure deranged *kapha* and *vata*, polyuria, piles, worms and skin diseases.

Occurrence & Distribution : Throughout the hotter parts of India, particularly along the seacoast and up to an altitude of 830 m. Common in West Bengal and South India. Cultivated often as a hedge plant.

Description : A large scandent prickly shrub. Branches small, yellow, covered with downy prickles. Leaves bipinnate; leaflets 12-16, elongated, upper part thick. Peduncle long, bearing dense flowers at the top. Pods prickly, wingless, swollen in the middle and slightly flat. .

Flowers during rainy season and fruits during winter.

Parts Used : Seeds, leaves and bark.

Therapeutic Uses : *Seeds* : recommended in fever, asthma and colic (dose 0.7 to 2.1 g of powdered seeds with equal quantity of black pepper); used externally in cases of inflammation; oil : emollient and efficacious for stopping discharges from the ear and other skin diseases; *leaves* (tender) in disorders of liver; boiled with castor oil or butter fat effective when applied externally on painful and swollen testicles; *leaves* and *bark* : emmenagogue, anthelmintic and febrifuge.

Chemical Constituents : Seeds yield L-γ-ethylideneglutamic acid and amino acids. Fatty acid composition of the seed-oil is reported. α-, β-, γ-, δ-, ξ- and ψ-caesalpins, caesalpin-F and 7-hydroxy-4'-methoxyhomoisoflavone (bonducelline) have been isolated from the seed kernels (*Indian J. Appl. Chem.*, 1960, **23**, 221; *Pakist. J. sci. industr. Res.*, 1961, **4**, 104; 1960, **3**, 48; *Chem. Abstr.*, 1961, 55, 18901; *Tetrahedron Lett.*, 1963, 2079; *Gazz. Chim. Ital.*, 1966, **96**, 662; *Chem. Abstr.*, 1966, **65**, 8968; *Tetrahedron Lett.*, 1967, 5027; *Chem.*

Commun., 1970, 1244; *Phytochemistry*, 1972, **11**, 2573; *Curr. Sci.*, 1976, **45**, 450; *Indian J. Chem.*, 1981, **20B**, 625; *ibid.*, 1982, **21B**, 383 (and the references cited therein); *J. nat. Prod.*, 1986, **49**, 913).

125. *Caesalpinia digyna* Rottl.

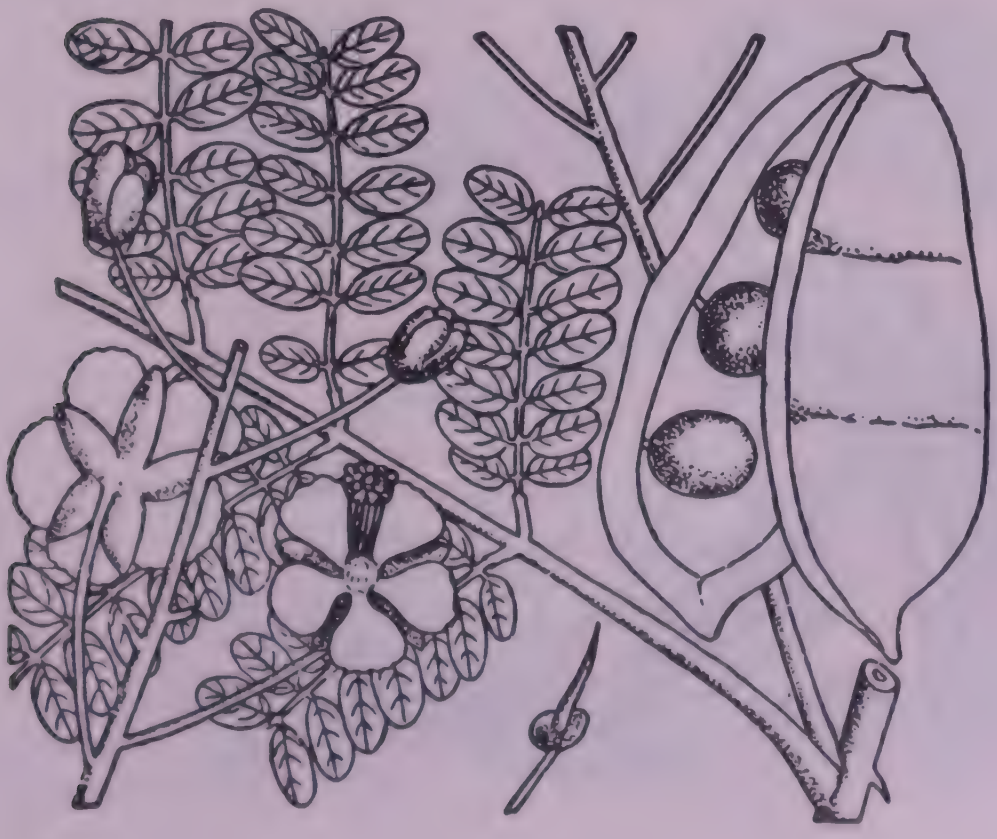
Vernacular Names : Sans : *Vakeri*; Hind : *Vakarimul*; Beng : *Umulkuchi*; Eng : Teri pods.

वाकेरी तु त्रिदोषघ्नी शोषघ्नी तुवरा परम् ।
शस्यते गण्डमालायां प्रमेहे राजयक्ष्मणि ।।
(द्रव्यगुण)

vākērī tu tridōṣaghnī śōṣaghnī tuvarā param .
sasyatē gaṇḍamālāyāṃ pramēhē rājayakṣmaṇi ..
(dravyaguṇa)

It pacifies deranged *tridosha*; cures emaciation; *tuvara* (*kashaya*); most efficacious in goitre, polyuria and tuberculosis.

Occurrence & Distribution : Assam, West Bengal and the Andamans.



Description : A prickly scandent shrub. Branches glabrous or slightly downy; prickles uniform, scattered. Leaves thin; leaflets 16-20, membranous, oblong, obtuse, dark-green and glabrous above but glabrescent or obscurely downy below. Flowers borne in peduncled racemes, yellow. Pods oblong, torulose, turgid, glabrous, 3.8-5.1 cm long. Seeds 2-4.

Flowers in rainy season and fruits in winter.

Part Used : Root.

Therapeutic Uses : *Root* : astringent, given internally in scrofulous affections and diabetes.

Chemical Constituents : Leaves of the plant yield caesalpinine A, B and celallocinnine. Bergenin has been isolated from the root (*J. sci. industr. Res.*, 1957, **16B**, 511; *J. Amer. chem. Soc.*, 1983, **105**. 4441; *J. chem. Soc. Perkin Trans*, 1985, 2, 193).

126. *Caesalpinia pulcherrima* (L.) Sw. syn. *Poinciana pulcherrima* L.

Vernacular Names : Sans : *Ratnagandhi*; Hind : *Gulutora*; Beng : *Krishnachura*; Tam : *Mayikonnai*; Eng : Peacock flower.

Occurrence & Distribution : Usually cultivated as an ornamental plant in many parts of India.

Description : A large shrub or small tree, 3.7-4.3 m in height. Prickles sparse on branches. Bark grey. Leaves abruptly bipinnate; leaflets in 12-18 pairs, 1.3-1.9 cm long. Flowers red or yellow, fragrant. Pods flat, thin, straight, strap-shaped, 5.1- 7.6 cm long.

Flowers from September-November and fruits from March-April.

Parts Used : Flowers, leaves and bark.

Therapeutic Uses : *Flowers* : infusion prescribed in bronchitis, asthma and malaria; *leaves* : purgative, tonic and emmenagogue; *bark* : abortifacient.

Chemical Constituents : Yellow flowers contain myricetin and its 3-rhamnoside in addition to quercetin, rutin, β-sitosterol, lupeol gallic acid and sugars obtained from red flowers; gallic, ellagic and sebacic acids, leucodelphinidin, quercimeritrin, tannins and ellagitannin from the stem-bark; caesalpin, pulcherralpin, 6-methoxypulcherrimin, 8-methoxybonducellin, bonducellin, 2,6-dimethoxybenzoquinone and 4′-methylisoliquiritigenin from the stem have been reported. The root contains vouacapen-5α-ol, 6β-cinnamoyl-7β-hydroxyvouacapen-5α-ol and 8,9,11,14-dihydrovouacapen-5β-ol and β-sitosterol (*Chem. Ind.*, 1970, 534; *Curr. Sci.*, 1976, **45**, 661; *J. Indian chem. Soc.*, 1977, **54**, 646; *Indian J. Pharm. Sci.*, 1978, **40**, 103; *Curr. Sci.*, 1980, **49**, 769; *Phytochemistry*, 1983, **22**, 2835; *ibid.*, 1986, **25**, 167; *J. nat. Prod.*, 1986, **49**, 561).

127. *Caesalpinia sappan* L.

Vernacular Names : Sans : *Patranga*; Hind & Beng : *Patang*; Tam *Patungam*; Eng : Sappan wood.

पत्रांगं कटुकं रूक्षंमम्लं शीतञ्च गोल्यकम् ।
वातपित्तज्वरघ्नञ्च विस्फोटोन्मादभूतहृत् ॥
(राजनिघण्टु)

patrāṅgaṃ kaṭukaṃ rukṣamamlaṃ śītañca gōlyakam .
vātapittajvaraghnañca visphōṭōnmādabhūtahṛt ..
(rājanighaṇṭu)

The plant is *katu*, *ruksha*, *amla*, *sheeta*(*sheetaveerya*) and gaulya (*madhura*); beneficial in the treatment of fever and deranged *vata* and *pitta* and mental disorder; cures boils.

Occurrence & Distribution : In West Bengal and South India. Generally cultivated as a hedge plant.

Description : A shrub or small tree. Wood yellow when freshly cut but quickly turns red. Prickles on branches thinly dispersed and small. Flowers yellow; peduncle as long as the rachis. Pods prickly, slightly flat, 7.6-10.2 cm × 3.8 cm.

Flowers during summer and fruits during winter.

Part Used : Wood.

Therapeutic Uses : *Wood* : decoction used as an emmenagogue; beneficial in mild cases of dysentery and diarrhoea; prescribed internally in certain skin diseases.

Chemical Constituents : Leaves contain *d*-α-phelandrene and oscimene. Triglycerides of fatty acids are reported from the seeds. Heartwood contains β-amyrin glucoside, amino acids, monosaccharides, fatty acids, protosappanins A, B and C [(7R)-7,8-dihydro-3,7,10,11-tetrahydroxy-7(6H)-dibenzoxocincarbaldehyde], 7-hydroxy-3-(4′-hydroxybenzylidene)-chroman-4-one, 3,7-dihydroxy-3-(4′-hydroxybenzyl)-chroman-4-one, 3, 4, 7-trihydroxy-3 (4′-hydroxybenzyl)-chroman, 4,4′-dihydroxy-2′-methoxychalcone, 8-methoxy-bonducellin,

quercetin, rhamnetin and embuin. Brazilin I and II, 3′-O-methyl-sappanol, 3′-O-methylepisappanol, 3′-O-methyl brazilin, 4-O-methylsappanol, 4-O-methyl-episappanol, sappanone-B, 3- deoxysappanone-B, 3′-deoxysappanone-B, caesalpin J and P, dibenzoxocin derivative, octacosanol, β- sitosterol and taraxerol are also reported from the plant (*Planta Med.*, 1977, **31**, 214; *Indian J. Pharm.*, 1977, **39**, 85; *Acta Ciene Indica*, 1978, **4**, 120; *Chem. Abstr.*, 1979, **90**, 51441; *Seifer Oele. Fette. Wachse*, 1984, **110**, 577; *Chem. Abstr.*, 1985, **102**, 59387; *Phytochemistry*, 1985, **24**, 2403; *Chem. Pharm. Bull.*, 1985, **33**, 3545; *ibid.*, 1986, **34**, 1, 2506; Heterocycles 1986, **24**, 601; *Chem. Pharm. Bull.*, 1987, **35**, 2761, 3002, 3597, 3615; *Acta Ciene Indica*, 1987, **13**, 87; *Chem. Abstr.*, 1988, **109**, 187282; *Phytochemistry*, 1987, **26**, 1831).

128. *Cassia absus* L.

Vernacular Names : Sans: ***Paundaryam***; Hind & Beng : *Chaksu*; Tam : *Mulaippal-virai.*

पौण्ड्यर्यं मधुरं तिक्तं कषायं शुक्रलं हिमम् ।
चक्षुष्यं मधुरं पाके वर्ण्यं पित्तकफप्रणुत् ॥

(भावप्रकाश)

paunḍayaryaṃ madhuraṃ tiktaṃ kaṣāyaṃ śukralaṃ himam .
cakṣuṣyaṃ madhuraṃ pākē varṇyaṃ pittakaphapraṇut ..

(bhāvaprakāśa)

It is *madhura*, *tikta*, *kashaya*, spermatopoetic, *hima* (*sheetaveerya*), beneficial for eyes; *madhura-vipaka*; improves complexion; pacifies deranged *pitta* and *kapha*.

Occurrence & Distribution : All over India.

Description : An erect annual plant, 30.5-61.0 cm high. Stems and leaves having grey bristly viscose hairs. Leaves simple, abruptly pinnate, oblong, very oblique, subacute or obtuse. Racemes narrow, equalling or exceeding the leaves. Pods oblique, ligulate, 2.5-3.8 cm long. Seeds 5-6, flat, oblong, lustrous, bitter and black.

Flowers in November-February and fruits in December.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* and *leaves* : in the treatment of conjunctivitis, ring worm and other skin diseases.

Chemical Constituents : The seeds, leaves and root contain the alkaloids, chaksine and isochaksine. Fatty acid composition of the seed oil is also reported; β-sitosterol-β-D-glucoside and D-galacto-D-mannan; palmitic, gentisic and 5-O-D-glucopyranosyl-gentisic acids; ethyl-α-D-galactopyranoside; apigenin, hydnocarpin, isohydnocarpin and luteolin from the seeds; quercetin and rutin from the leaves; aloe-emodin and chrysophanol from the roots have been reported (*Wlth India*, 1950, **2**, 93; *Pakist. J. sci. industr. Res.*, 1964, **7**, 219; *Chem. Abstr.*, 1965, **63**, 3314; *Canad. J. Chem.*, 1969, **47**, 2883; *Indian J. Chem.*, 1977, **15B**, 764; *J. nat. Prod., 1979, 42, 299; Angew. Chem. Int. Edn.*, 1985, **24**, 959).

129. *Cassia alata* L.

Vernacular Names : Sans : *Chakramarda*, Hind : *Dadmurdan*; Beng : *Dadmari*; Tam : *Sheemai agatti*; Eng : Ringworm senna.

चक्रमर्दो लघुः स्वादु रूक्षः पित्तानिलापहः।
श्ल्यो हिमः कफश्वासकुष्ठदद्रुक्रिमीन् हरेत् ।।
हन्त्युष्णं तत्फलं कुष्ठकण्डूदद्रुविषानिलान् ।
गुल्मकासक्रिमिश्वासनाशनं कटुकं स्मृतम् ।।

(द्रव्यगुण)

cakramadardō laghuḥ svādu rukṣaḥ pittānilāpahaḥ.
hṛdyō himaḥ kaphaśvāsakuṣṭhadadrukrimīn harēt ..
hantyuṣṇaṃ tatphalaṃ kuṣṭhakaṇḍūdadruviṣānilān .
gulmakāsakrimiśvāsanāśanaṃ kaṭukaṃ smṛtam ..

(dravyaguṇa)

It is *laghu*, svadu(*madhura*), *ruksha*; pacifies deranged *pitta* and anila (*vata*); cardiotonic, *hima* (*sheetaveerya*); beneficial in deranged *kapha*, dyspnea, worms and skin diseases including ringworm· fruit is *katu* and *ushna*, cures skin diseases including pruritus and ringworm; antidotal; beneficial in deranged *anila* (*vata*), abdominal lump, cough, worms and dyspnea.

Occurrence & Distribution : Cultivated in gardens and sometimes found wild in West Bengal and many other parts of the country.

Description : A shrub, with very thick finely downy branches. Leaves simple, pinnate, subsessile, 30.5-61.0 cm long; leaflets oblong, obtuse, minutely mucronate, rigidly subcoriaceous, glabrous or obscurely downy beneath. Racemes peduncled, 1.3-2.5 cm. Flowers large, yellow. Stamens unequal. Pods straight, membranous, dehiscent, glabrous, 10.2-20.4 cm long. Seeds 50 or more.

Flowers in October-February and fruits in December.

Parts Used : Flowers and leaves.

Therapeutic Uses : *Flowers* : extracts used internally in cases of bronchitis; *leaves* : decoction in combination with lemon juice used in the treatment of ringworm and eczema.

Chemical Constituents : Seeds yield galactomannan; β-sitosterol, aloe-emodin, emodin, rhein and their glycosides and chrysophanol have been isolated from fruits and leaves : (*Planta med.*, 1970, **19**, 299; *Asian J. Pharm.*, 1976, **3**, 10, 17; *Chem. Abstr.*, 1977, **86**, 40173; *Curr. Sci.*, 1978, **47**, 271; *Rev. Peru. Bioquim.*, 1977, **1**, 31; *Chem. Abstr.*, 1978, **88**, 101586; *Indian J. Chem.*, 1987, **26B**, 21).

130. *Cassia senna* L. var. *senna* Brenan
syn. *C. angustifolia* Vahl

Vernacular Names : Sans : *Kalyani*; Hind : *Sona-ka-pat*; Beng : *Sona-mukhi*; Tam : *Nila virai*; Eng : Indian senna.

विट्संगं वस्तिमान्द्यञ्च यकृद्दाल्युदरं तथा ।
प्लीहोदरं वद्धगुदमजीर्णं विषमज्वरम् ॥
कृमिकुष्ठं पाण्डुरोगञ्च कल्याणी शमयेत् ध्रुवम् ॥

(द्रव्यगुण)

viṭsaṅgaṃ vahniṃāndyaṁca yakṛdaḍālyudaraṃ tathā .
plīhōdaraṃ vaḍvagudamajīrṇaṃ viṣamajvaram ..
kāmalāṃ pāṇḍurōgaṁca kalyāṇī kṣapayēt dhruvam ..
(dravyaguṇa)

It is used in constipation, loss of appetite, hepatomegaly, spleenomegaly, indigestion, malaria, jaundice and anaemia.

Occurrence & Distribution : Cultivated mainly in South India, particularly Tamil Nadu, Karnataka and Andhra Pradesh.

Description : A small shrub, 61-91 cm in height. Leaves paripinnate; leaflets in 7-8 pairs, glabrous, yellowish-green, 2.5-5.1 cm × 0.4-1.3 cm. Flowers yellow. Pods greenish-brown to dark-brown, 3.4-6.8 cm long and 1.9 cm broad. Seeds 5-7, obovate, smooth, dark-brown.

Flowers and fruits almost throughout the year.

Parts Used : Fruits and leaves.

Therapeutic Uses : *Fruits* and *leaves* : laxative and purgative; *leaves* : (powder) admixed with vinegar applied externally to cure skin diseases.

131a. *Cassia fistula* L. (flowers)

131b. *Cassia fistula* L. (fruits)

132. *Cassia occidentalis* L.

133. *Cassia sophera* L.

135. *Saraca asoka* (Roxb.) de Wilde

136. *Tamarindus indica* L.

Chemical Constituents : Sugars and galactomannan have been isolated from the seeds. Ceryl alcohol, fistulin, leucopelargonidin tetramer, kaempferol, rhein and a new dianthraquinone glucoside occur in the flowers. The pods contain 1,4-dihydroxy-6,7-dimethoxy-2-methyl-anthraquinone-3-carboxylic acid (fistulic acid). The bark and heartwood contain barbaloin, fistucacidin, an optically inactive leucoanthocyanidin, 3,4,7,8,4′-pentahydroxyflavan and rhein. Leucoanthocyanidin-5, 4′-dihydroxyflavan-3,4-diol and a dimeric proanthocyanidin have been reported from the sapwood. Rhein and its glucoside, sennosides A and B occur in the leaves. Stem-bark yields lupeol, β- sitosterol and hexacosanol besides tannin. Seven new biflavanoids and two triflavanoids besides clitorin, chrysophanic acid, emodin, epicatechin, (–)-epiafzelechin and its 3-O-glucoside, kaempferol-3β-glucoside, kaempferol-3-neohesperidoside, phlobaphene and procyanidin have also been reported (*Wlth India*, 1950, **2**, 97, CSIR, New Delhi; *Curr. Sci.*, 1964, **33**, 462; *Indian J. Pharm.*, 1965, **27**, 71; *Indian J. Chem.*, 1966, **4**, 460; *Tetrahedron*, 1967, **23**, 515; *Indian J. Pharm., 1968, 30, 8; Leather Sci.*, 1968, **15**, 171; *Chem. Abstr.*, 1969, **70**, 47233; *J. Indian chem. Soc.*, 1968, **45**, 744; *Indian J. Chem.*, 1971, **9**, 1085; *ibid.*, 1972, **10**, 379; *Planta med.*, 1972, **21**, 150; *Shoyakugaku Zasshi*, 1977, **31**, 172; *Chem. Abstr.*, 1978, **88**, 148947; *Indian J. Chem.*, 1982, **21B**, 626; *Chem. Pharm. Bull.*, 1988, **36**, 39).

132. *Cassia occidentalis* L.

Vernacular Names : Hind : *Kasondi*; Beng : *Bara kalkesenda*; Tam : *Paeravirai*; Eng : **Negro coffee**.

Occurrence & Distribution : Scattered from the Himalayas to South India.

Description : A diffuse undershrub or shrub. Leaves paripinnate, with a foetid smell. Peduncle small, bearing a few yellow flowers having reddish tinge. Pods flat, slightly curved, dehiscent. Seeds 25-30.

Flowers and fruits almost throughout the year, mainly during July-November.

Parts Used : Seeds, leaves and root.

Therapeutic Uses : *Seeds*, *Leaves* and *root* : purgative; *seeds* and *leaves* : applied externally in skin diseases; *root* : diuretic and antiperiodic.

Chemical Constituents : C-flavonosides of apigenin have been isolated from the pericarp and emodin, physcion and its β-glucopyranoside from the flowers. The seeds contain chrysolein, linoleic, linolenic and oleic acids; campesterol; 8-carbomethoxy-1,7-dihydroxy-3-methylxanthone (cassiollin=pinselin), 1,8-dihydroxy-2-methylanthraquinone, 1,4,5-trihydroxyanthraquinone derivatives, *viz.*, helminthosporin, islandicin and xanthorin along with 1,4,5-trihydroxy-7-methoxy-3-methylanthraquinone, N-methyl morpholine, tannic acid and

toxalbumin. The leaves yield aloe-emodin, a bianthraquinone, chrysophanol, dianthronic heterosides, jaceidin-7-rhamnoside, matteucino l-7-rhamnoside, rhein and potassium chelidonate. The roots produce chrysophenol, emodin, physcion, 1,7-dihydroxy-5-methoxycarbony-l-3-methylxanthone and β-sitosterol which is also found in the flowers and seeds. 1,8-Dihydroxy- and oxymethyl-anthraquinones, emodol, luteolin dimethylether-rhamnoside, quercetin and polysaccharides have been reported from the plant (*Wlth India*, 1950, **2**, 97; *Anais Fac. Farm. Porto*, 1964, **24**, 65; *Chem. Abstr.*, 1965, **63**, 17797; *Ann. Pharm. Fr.*, 1968, **26**, 673; *Chem. Abstr.*, 1969, **70**, 84918; *Indian J. Pharm.*, 1968, **30**, 282; *J. chem. Soc.(C)*, 1970, 1285; *J. Agric. Fd. Chem.*, 1971, **19**, 198; *Chem. Abstr.*, 1971, **74**, 50512; *Phytochemistry*, 1971, **10**, 670; *ibid.*, 1973, **12**,1186; *Planta med.*, 1973, **23**, 299; *Experientia*, 1973, **29**, 141; *ibid.*, 1974, **30**, 850; *Indian J. Chem.*, 1974, **12**, 1042, 1045; *Planta med.*, 1977, **32**, 375; *Phytochemistry*, 1977, **16**, 1107; *Chem. Lett.*, 1987, 511).

133. *Cassia sophera* L.

Vernacular Names : Sans : *Kasamarda*; Hind : *Kasaunda*; Beng : *Chota kalkesenda*; Tam : *Sularai*; Eng : Sophera senna.

कासमर्दः सतिक्तोष्णो मधुरः कफवातनुत् ।
अजीर्णकासपित्तघ्नः पाचनः कण्ठशोधनः ॥
(राजनिघण्टु)

kāsamardaḥ satiktōṣṇō madhuraḥ kaphavātanut .
ajīrṇakāsapittaghnaḥ pācanaḥ kaṇṭhaśōdhanaḥ ..
(rājanighaṇṭu)

It is *tikta*, *ushna*, *madhura*; beneficial in deranged *kapha*, *vata* and *pitta*, dyspepsia, cough; digestive; useful in throat affections.

Occurrence & Distribution : Common throughout the tropical regions of India.

Description : A bushy undershrub with green branches. Leaves paripinnate; leaflets in 6-7 pairs, oblong-lanceolate. Flowers small, yellow. Pods slightly turgid, not impressed between seeds.

Flowers and fruits during November-July.

Parts Used : Whole plant, seeds, leaves, stem-bark and root.

Therapeutic Uses : *Whole plant*, *seeds*, *stem-bark* and *root* : cure cough, act as an expectorant and efficacious in acute bronchitis; *seeds* : anthelmintic and

cure skin diseases; *leaves* : anthelmintic and used externally in ringworm, decoction made into paste with sandal wood finds application in the treatment of tapeworm, juice used in the treatment of gonorrhoea.

Chemical Constituents : Emodin, chrysophanic acid, rhamnetin-3-O-β-D-glucoside and chrysophenol (*Wlth India*, 1950, **2**, 98, CSIR, New Delhi; *Planta med.*, 1975, **28**, 182).

134. *Cassia tora* L.

Vernacular Names : Sans : *Chakramarda**; Hind & Beng : *Chakunda*; Tam : *Tagarai*; Eng : Sickle senna.

चक्रमर्दः कटुस्तीव्रः मेदोवातकफापहः ।
व्रणकण्डूति कुष्ठार्त्तिद्रुपामादिदोषनुत् ॥
(राजनिघण्टु)

cakramardaḥ kaṭustīvraḥ mēdōvātakaphāpahaḥ .
vraṇakaṇḍūti kuṣṭhārttidadrupāmādidōṣanut ..
(rājanighaṇṭu)

It is *katu* (extremely pungent), beneficial in obesity, deranged *vata* and *kapha*, ulcer, pruritus, skin diseases like ringworm and scabies.

Occurrence & Distribution : Throughout the tropical parts of India.

Description : An annual bushy foetid herb or undershrub. Leaves paripinnate, 2.5-3.8 cm; leaflets ovate-oblong. Flowers small, yellow. Pods slender, sub-4-angled, 15.2-22.7 cm long and up to 0.8 cm diam. Seeds many, flat, dark.

Flowers and fruits throughout the year, mostly during July- December.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* and *leaves* : cure ringworm, itches and other skin diseases; laxative.

Chemical Constituents : Flowers contain kaempferol glucoside. Seeds and leaves contain amino acids, fatty acids, aloe-emodin, chrysophanol, emodin, rhein and sitosterol. Myricyl alcohol, chrysophanic acid and its 9-anthrone derivative, 8-hydroxy-3-methylanthraquinone-1-β-gentiobioside, a naphtho-α-

* Both *C. alata* and *C. tora* are commonly known as *Chakramarda* or *Dadrughna* meaning effective remedy for ring worm.

pyrone, physcion, rubrafusarin and its 6β-gentiobioside and toralactone, 1,3,5-trihydroxy-6,7-dimethoxy-2-methylanthraquinone, leucopelargonidin-3-O-α-L-rhamnopyranoside and β-sitosterol were isolated from the roots (*Curr. Sci.*, 1962, **31**, 285; *Indian J. Pharm.*, 1964, **26**, 175; *Curr. Sci.*, 1965, **34**, 481; *Indian J. Pharm.*, 1968, **30**, 282; *ibid.*, 1969, **31**, 27; *Chem. Pharm. Bull.*, 1969, **17**, 458; *Planta med.*, 1972, **21**, 393; *Yakugaku Zasshi*, 1973, **93**, 261; *Chem. Abstr.*, 1973, **78**, 156649; *Indian J. Chem.*, 1974, **12**, 1251; *Sci. & Cult.*, 1974, **40**, 316; *Curr. Sci.*, 1976, **45**, 450;*Indian J. Pharm.*, 1977, **39**, 116).

135. *Saraca asoca* (Roxb.) de Wilde syn. *S. indica* auct. non L.

Vernacular Names : Sans, Hind & Beng : *Ashoka*; Tam : *Asogam*; Eng : Asoka.

अशोकः शीतलस्तिक्तो ग्राही वर्ण्यः कषायकः ।
दोषापचीतृषादाहकृमिशोषविषाश्रजित् ॥
(भावप्रकाश)

aśōkaḥ śītalastiktō grāhī varṇyaḥ kaṣāyakaḥ
dōṣāpacītṛṣādāhakṛmiśōṣaviṣāsrajit ..
(bhāvaprakāśa)

It is *sheetala* (*sheetaveerya*), *tikta*, astringent; improves complexion; *kashaya*; subdues deranged *tridosha*; useful in adenitis; allays thirst; alleviates burning sensation; anthelmintic; beneficial in emaciation, poisoning and dyscrasia.

Occurrence & Distribution : Grows wild along streams or in shady evergreen forests up to an altitude of 750 m in the central and eastern Himalayas as well as in the Khasi, Garo and Lushai hills; abundant in South India.

Description : A small evergreen tree, 6-9 m in height. Bark with warty surface, dark-brown to grey or almost black. Leaves paripinnate, 15-20 cm long; leaflets 6-12, rigidly subcoriaceous, oblong or oblong-lanceolate, 7.5-22.5 cm × 1.3 cm. Flowers borne in dense axillary corumbs, very fragrant, orange or orange-yellow, finally turning vermillion-red. Pods, flat, oblong, woody, 7.6-25.4 x 3.8-5.1 cm. Seeds 4-8, ellipsoid-oblong, compressed.

Flowers in March-April and fruits in August-September.

Parts Used : Seeds, flowers and stem-bark.

Therapeutic Uses : *Seeds* : diuretic; *flowers* : effective in blood dysentery; *stem-bark* : reputed to cure colic, dysentery, dyspepsia, piles, ulcers and uterine troubles, in particular menorrhagia due to uterine fibroids, leucorrhoea and menstrual pain.

Chemical Constituents : The flowers contain fatty acids and gallic acid, apigenin-7-O-β-D-glucoside, cyanidin-3,5-diglucoside, kaempferol-3-O-β-D-glucoside, pelargonidin-3,5-diglucoside, quercetin and its 3-O-β-D-glucoside and sitosterol. Bark yields alkanes (C_{20}-C_{35}), esters (C_{34}-C_{60}) and primary alcohols (C_{22}-C_{30}), n-octacosanol, tannin, catachin, (+) catechol, (−)-epicatechin, (−)-epicatechol, leucocyanidin, leucopelargonidin, procyanidin B_2, 11-desoxy-procyanidin B, (24ξ)-24-methylcholest-5-en-3β-ol, (24ξ)-24-ethylcholest-5-en-3β-ol, (22B, 24ξ)-24-ethylcholest-5, 22-dien-3β-ol (*Curr. Sci.*, 1963, **32**, 502; *Indian J. Pharm.*, 1964, **26**, 110; *J. Indian chem. Soc.*, 1976, **53**, 632; *Quart. J. Crude Drug Res.*, 1976, **20**, 3; *Chem. Abstr*, 1077, **87**, 65371; *Collect. Czech. Chem. Commun.*, 1977, **42**, 1388; *Indian J. Chem.*, 1977, **15B**, 765; *Z. Naturforsch.*, 1985; **40B**, 855; *Chem. Abstr.*, 1985, **103**, 119952; *Indian Drugs.*, 1987, **24**, 501).

136. *Tamarindus indica* L.

Vernacular Names : Sans : *Amlika*; Hind : *Amli*; Beng : *Tentul*; Tam : *Amillam*; Eng : Tamarind tree.

अम्लिकाम्ला गुरुर्वातहरी पित्तकफासृक्‌ ।
पक्वा तु दीपनी रुक्षा सरोष्णा कफवातनुत्‌ ।।
(भावप्रकाश)

amlikāmlā gururvātaharī pittākaphāsrakṛt .
pakvā tu dīpanī rukṣā sarōṣṇā kaphavātanut ..
(bhāvaprakāśa)

Tamarind is *amla*, *guru*; subdues deranged *vata*; aggravates *pitta* and *kapha*; causes dyscrasia; gastric stimulant, *ruksha*, *sara*, *ushna*; pacifies deranged *kapha* and *vata* when ripe.

Occurrence & Distribution : Cultivated or naturalised almost throughout the plains and sub-Himalayan tracts as well as southern parts of India.

Description : A moderate-sized to large evergreen tree, up to 24 m in height and 7 m in girth. Bark horizontally and longitudinally fissured, dark-grey or brownish. Leaves alternate, paripinnate, up to 15 cm long; leaflets generally 10-20 pairs, sub-sessile, oblong, 8-30 mm × 5-10 mm. Flowers borne in lax few-flowered racemes at end of branchlets, small, yellow with pinkish stripes. Pods flat, obovate, dehiscent, scurfy, brown ash-coloured, 7.5-20.0 cm long and 2-2.5 cm broad. Seeds 3-12, obovate-oblong, compressed, with a shallow oblong pit on each side of the flat faces, smooth, lustrous, dark brown.

Flowers in June-July and fruits in November-December.

Parts Used : Seed-kernel, fruits, stem-bark and leaves.

Therapeutic Uses : *Seed-kernel* : used as milk purgative and stimulant; *ripe fruits* : anthelmintic, carminative, digestive and laxative, refrigerant and used as liver tonic; *leaves* : juice useful in bleeding piles and dysuria; *stem-bark* : antipyretic and astringent.

Chemical Constituents : Kernel yields polysaccharides which on hydrolysis yield 2,3,5-tri-O-methyl--arabinose, 2,3,4-tri-O-methyl-D-xylose, 2,3,4,6-tetra-O-methyl-D-galactose, 2,3,6-tri-O-methyl-D-glucose, 3,4-di-O-methyl-D-xylose, 2,3-di-O-methyl-D-glucose. Balsamine, catechin, nasturtium, tamarin, phosphatidic acid and its choline, ethanolamine, serine and inositol derivatives, lysophosphatidylcholine, lysophosphatidyl ethanolamine, proanthocyanidin and an alkaloid, hordenine, have been isolated from various parts of the plant (*J. sci. industr. Res.*, 1961, **20D**, 380; *Curr. Sci.*, 1964, 581; *New Zealand J. Sci.*, 1969, **12**, 171; *Chem. Abstr.*, 1969, **70**, 90708; *Zh. Obshch Khim.*, 1972, **42**, 2303; *Chem. Abstr.*, 1973, **78**, 72477; *An Quim.*, 1974, **70**, 1067; *Chem. Abstr.*, 1975, **83**, 179438; *J. Amer. Oil. Chem. Soc.*, 1979, **56**, 559; *Proc. Acad. Sci.* (*Plant Sci.*), 1984, **93**, 1).

B. *Mimosoideae*

137. *Acacia catechu* (L.f.) Willd.

Vernacular Names : Sans : *Khadira*; Hind & Beng : *Khayer*; Tam : *Karangalli*; Eng : Cutch tree.

खदिरस्तु रसे तिक्तः शीतः पित्तकफापहः ।
पाचनः कुष्ठकासास्रशोफकण्डूव्रणापहः ।।
(राजनिघण्टु)

khadirastu rasē tikta: śīta: pittakaphāpaha: .
pācana: kuṣṭhakāsāsraśōphakaṇḍūvraṇāpaha: ..
(rājanighaṇṭu)

It is *tiktarasa*, *sheeta* (*sheetaveerya*); subdues *pitta*, and *kapha*; digestive; useful in the treatment of skin disease, cough, dyscrasia, oedema, pruritus and ulcer.

Occurrence & Distribution : In drier regions of the sub-Himalayan tract up to an altitude of 1200 m from Punjab to north-eastern States, Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu.

Description : A moderate-sized tree. Bark dark greyish-brown, nearly 1.3 cm in thickness, exfoliating in long narrow strips. Sapwood yellowish white but heartwood red. Leaves pinnate with a pair of recurved prickles at base of rachis; pinnae 40-80; leaflets 60-100, small, ligulate. Flowers dark yellow in cylindrical spikes; pods thin, glabrous, lustrous, straight, strap-shaped, dark brown.

Flowers in rainy season and fruits in winter.

Parts Used : Bark and heartwood.

Therapeutic Uses : *Bark* : astringent; useful in passive diarrhoea either alone or in combination with cinnamon or opium; decoction given internally in leprosy; *heartwood* : the concentrated aqueous extract known as *khayer* gum or cutch is astringent, cooling and digestive; beneficial in cough and diarrhoea; applied externally to ulcers, boils and eruptions of the skin; used extensively in Ayurvedic formulations.

Chemical Constituents : The chief constituents of the heartwood are catechin and catechutannic acid. The wood contains *l*-epicatechin. (+)-Afzelchin, catechin tetramer, dicatechin, gallocatechin, gossypetin,

isorhamnetin, kaempferol and its dihydro derivative, procyanidin AC, quercetin, and taxifolin have been obtained. Acid hydrolysis of the gum afforded L-arabinose, D-galactose, D-rhamnose, aldobiuronic acid (6-β-D-glucoronosyl-D-galactose), 6-O-β-D-glucopyranosyluronic acid-D-galactose, 3-O-β-D-galactopyranosyl-D-galactose, O-β-D-galactopyranosyl (1→3)-O-β-D-galactopyranosyl (1→3)-D-galactopyranose (*Indian J. Chem.*, 1976, **14B**, 661; *ibid.*, 1981, **20B**, 628, and the references cited therein; *Wlth India*, 1985, **1A**, 25, CSIR, New Delhi. *Indian J. Chem.*, 1988, **27B**, 55).

138. *Acacia farnesiana* (L.) Willd.

Vernacular Names : Sans : *Vitkhadira*; Hind : *Gandh babul*; Beng : *Guye babul*; Tam : *Kadivel*; Eng : Cassie flower.

विट्खदिरः कटुरुष्णस्तिक्तो रक्तव्रणोत्थदोषहरः ।
कण्डूतिविषविसर्पज्वर कुष्ठोन्मादभूतघ्नः ।।

(राजनिघण्टु)

viṭkhadira: kaṭurusṇastiktō raktavraṇōtthadōṣahara: .
kaṇḍūtiviṣavisarpajvara kuṣṭhōnmādabhūtaghna: ..
(rājanighaṇṭu)

The plant is *katu*, *ushna* and *tikta*; beneficial in septic ulcer; efficaceous in pruritus, poisoning, erysepelas, fever and skin diseases; used in the treatment of insanity and other mental disorders.

Occurrence & Distribution : In tropical parts of India.

Description : A thorny bush or small tree, attaining a height of 4.5 m. Branches spread out from the main trunk. Bark with brown streaks. Leaves bipinnate with stipular spines. Flowers borne in axillary heads, fragrant, bright yellow. Pods dull brown, not flat, 5.0-7.5 cm long.

Flowers during winter and fruits during rainy season.

Parts Used : Leaves and bark.

Therapeutic Uses : *Leaves* : infusion of tender leaves given internally in cases of gonorrhoea; *bark* : astringent and useful in polyuria.

Chemical Constituents : Eicosane, *cis*-3-methyl-dec-3-en-1-ol; benzyl alcohol, farnesol, geranyl acetate, linalool, linalyl acetate, nerolidol, pinitol,

α-terpineol, a mixture of cresols, ethylphenols, cumnaldehyde, hydroxy-acetophenone, ionones, butyric, palmitic, benzoic and salicylic acids, trans-3-methyl-dec-4-enoic acid, coumarin, homoterpene lactone; dihydroactinidiolide and isorhamnetin-3,7-glucorhamnoside have been isolated from the flowers. The ripe pods contain gallic acid and its derivatives, ellagic acid, tannin; aromadendrin, kaempferol, naringenin and their glucosides and (–)-5,7,4′-trihydroxyflavanone-7-O-β-D-6″-galloyl-glucopyranoside while apigenin and rutin glucosides have been found in the leaves. Seeds furnish a new sulphur amino acid, N-acetyl-L-djenkolic acid (*Wlth India*. 1985, **1A**. 32. CSIR, New Delhi).

139. *Acacia nilotica* Delile ssp. *indica* (Benth.) Brenan syn. *A. arabica* (Lam.) Willd. var. *indica* Benth.

Vernacular Names : Sans : *Babbula*; Hind : *Babul*; Beng : *Babla*; Tam : *Karuvelei*; Eng : Indian gum arabic tree.

वव्वुलः कफ्नुद् ग्राही कुष्ठक्रिमिविषापहः ।
वव्वुलस्य तु निर्य्यासः ग्राही पित्तानिलापहः ॥
रक्तातिसारपित्तास्रमेहप्रदरनाशनः ।
भग्नसन्धायकः शीतः शोणितस्रूतिवारणः ॥
(द्रव्यगुण)

vavvula: kaphnud grāhī kuṣṭhakrimiviṣāpaha: .
vavvulasya tu niryyāsa: grāhī pittānilāpaha: ..
raktātisārapittāsramēhapradaranāśana: .
bhagnasandhāyaka: śīta: śōṇitasrūtivāraṇa: ..
(dravyaguṇa)

It subdues deranged *kapha*; astringent, beneficial in skin diseases; antihelmintic; antidotal. Its extract is astringent, subdues *pitta* and *anila* (vata); effective in the treatment of blood dysentery, haemorrhagic diseases, polyuria, leucorrhaea, fractures; *sheeta* (*sheetaveerya*) and styptic.

Occurrence & Distribution : Throughout the drier regions of India, particularly in Andhra Pradesh and Maharashtra.

Description : A medium-sized, tree with a short trunk, (girth of 1.2 m), a spreading crown and feathery foliage, usually attaining a height of 15 m. Bark almost black to dark brown, deeply cracked or longitudinally fissured. Sapwood wide and whitish, but heartwood pinkish white to light red when first exposed, turning reddish brown with age, usually mottled with darker streaks. Leaves bipinnate with spinescent stipules, 2.5-5.0 cm long. Flowers crowded in

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India

long-peduncled globose heads, forming axillary clusters of 2-5 heads, fragrant, golden-yellow. Pods white, flat, containing 8-12 seeds, 7.5-15.0 cm long.

Flowers during summer and fruits during winter.

Parts Used : Pods, leaves, bark and gum.

Therapeutic Uses : *Pods* : decoction beneficial in urinogenital diseases; *leaves* : infusion of tender leaves used as an astringent and remedy for diarrhoea and dysentery; *bark* : decoction used as a gargle in sore throat and toothache; dry powder applied externally in ulcers; *gum* : astringent and styptic.

Chemical Constituents : Flowers provide stearic acid, kaempferol-3-glucoside, isoquercetin, leucocyanidin. Bark yields several polyphenolic compounds, (+)-catechin, (−)-epicatechin, (+)-dicatechin, epigallocatechin, quercetin, gallic acid, (+)-leucocyanidin gallate, sucrose and tannin. *m*-Digallic acid and chlorogenic acid, galloylated flavan-3,4-diol, and 7,3′,4′,5′-tetrahydroxyflavan-3,4-diol have been reported from the pods. Gum contains galactose, L-rhamnose, L-arabinose and its derivatives along with four aldobiouronic acids. Seeds contain amino acids, fatty acids and ascorbic acid along with tannin as the major constituent (*Indian J. Chem*, 1963, **1**, 542, *Vijnana Parishad Anusandhan Patrika*, 1975, **18**, 41; *Chem. Abstr*, 1976, **84**, 40784; *Wlth India*, 1085, **1A**, 39, CSIR, New Delhi).

140. *Acacia polyacantha* Willd. syn. *A. suma* (Roxb.) Kurz; *A. suma* Buch.-Ham. ex Voigt.

Vernacular Names : Sans : *Shami*; Hind : *Chhikur*: Beng : *Saikanta*: Tam : *Kodil*.

शमी रुक्षा कषाया च रक्तपित्तातिसारजित् ।
तत् फलन्तु गुरु स्वादु तिक्तोष्णं केशनाशनम् ।।
(राजनिघण्टु)

śamī rukṣā kaṣāyā ca raktapittātisārajit .
tat phalantu guru svādu tiktōṣṇaṃ kēśanāśanam ..
(rājanighaṇṭu)

The plant is *ruksha, kashaya*; effective in the treatment of haemorrhagic diseases and diarrhoea; fruit is *guru, svadu* (*madhura*), *tikta, ushna*; causes loss of hair.

Occurrence & Distribution : West Bengal, Bihar and Maharashtra.

Description : A medium-sized tree, with white bark exfoliating in papery flakes and marked at intervals by horizontal patches of dark colour. A pair of

stipular prickles below each leaf. Pinnae 10-20 pair; leaflets numerous, linear, grey or greyish green when dry. Flowers white or pale yellow. Fruits 7.6-10.2 cm long and 1.3-3.8 cm broad. Seeds 6-8.

Flowers in rainy season and fruits in winter.

Parts Used : Pods, leaves and bark.

Therapeutic Uses : *Pods* : decoction beneficial in urino- genital diseases; *leaves* : infusion of tender leaves used as an astringent and remedy for diarrhoea and dysentery; *bark* : decoction used as a gargle in sore throat and toothache; dry powder applied externally in ulcers.

Chemical constituents : The seeds contain ascorbic acid, niacin and protein which on hydrolysis yields histidine, isoleucine, leucine, lysine, methionine, phenylalanine, tryptophan, tyrosine, and valine. The leaves yield N,N-dimethyltryptamine. Quercetin and 5,4′-dihydroxy-7,3′-dimethoxyflavone-3-O-D-galactopyranoside are found in the heartwood. A proanthocyanidin with a

C-C-linkage between the 4-position of 3,3′,4′,5,5′, 7-hexahydroxyflavan and the 8-position of the (-)-epicatechin moiety is reported from the bark (*Lloydia*, 1975, **38**, 176; *Wlth India*, 1985, **1A**, 42, CSIR, New Delhi).

141. *Acacia tomentosa* Willd.

Vernacular Names : Sans : *Jalbarburaka*; Beng : *Salshai babla.*

जालवर्बुरको रुक्षो वातामयविनाशकृत् ।
पित्तकृच्छ्र कषायोष्णः कफहृद्दाहकारकः ।।
(राजनिघण्टु)

jālavarvurakō rukṣō vātāmayavināśakṛt .
pittakṛcchra kaṣāyōṣṇa: kaphahṛdadāhakāraka: ..
(rājanighaṇṭu)

The plant is *ruksha*; beneficial in the diseases caused by the aggravated *vata*; excites *pitta*; cures dysuria, *kashaya*, *ushna*; subdues deranged *kapha* and causes burning sensation.

Occurrence & Distribution : Found in the Sunderbans and western part of Southern India.

Description : A small tree, with branchlets and leaf-rachises densely covered with fine grey hairs, the latter with several glands. Bark grey-black, cracked into

quandrangular pieces, 2 mm thick. Thorns spindle-shaped, blackish. Leaves crowded on arresting axillary branches, up to 10 cm long; leaflets 8-16 pairs, sessile, oblong-linear, subcoriaceous, glabrescent. Flowers borne in axillary pedunculate heads, white. Pods thin, flat, ligulate, slightly falcate, short-stalked, 10-15 cm long and 1.0-1.5 cm wide. Seeds 6-10, flat, oval, areolate, brownish-green.

Flowers in summer and fruits in rainy season.

Parts Used: Pods, leaves and bark.

Therapeutic Uses : Similar to those of *Acacia nilotica* (vide page 52).

142. *Adenanthera pavonina* L.

Vernacular Names : Sans : *Kunchandana*; Hind : *Barighumchi*; Beng : *Rakta-kambal*; Tam : *Anikundumani*; Eng : Coral wood.

Occurrence & Distribution : In the Eastern sub-Himalayan tract, South India, along Western Ghats and in the Andamans.

Description : A deciduous fast-growing tree, 18-24 m in height and 2.0-2.4 m in girth. Bark rough on old trees, dark brown or greyish-brown outside and brownish-white or white inside. Leaves bipinnate, 20-30 cm long; leaflets alternate, glaborous, obtuse, elliptic-oblong, papery, 4-8 pairs. Flowers borne in short-peduncled axillary racemes or panicled at the end of branches, fragrant, yellowish. Pods twisted, linear, narrow, 15-20 cm long, containing small hard lustrous scarlet seeds.

Flowers during summer and fruits during winter.

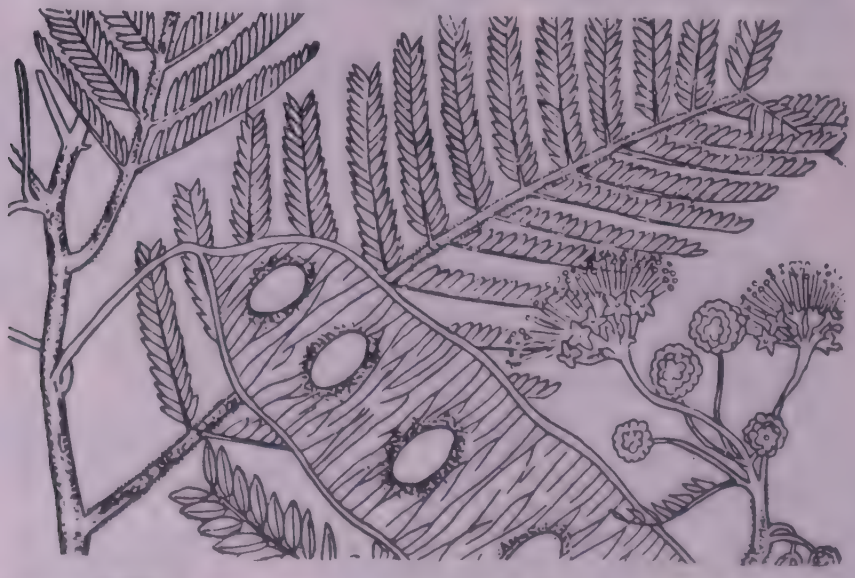
Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : powder applied as a *poultice* to abscess to promote suppuration; *leaves* : decoction used in chronic rheumatism, gout, piles and in haemorrhage.

Chemical Constituents : The seeds contain amino acids, dulcitol, stigmasterol and its glucoside. Octacosanol, dulcitol and its glucoside, β-sitosterol glucoside and stigmasterol have been reported from the leaves. The bark contains, besides stigmasterol glucoside, butein, chalcone, dihydrorobinetin, dihydromyricetin, 2,4-dihydroxybenzoic acid, robinetin and a saponin which on hydrolysis and methylation afforded methyl echinocystate and methyl oleanolate (*Wlth India*, 1985, **1A**, 74, CSIR, New Delhi).

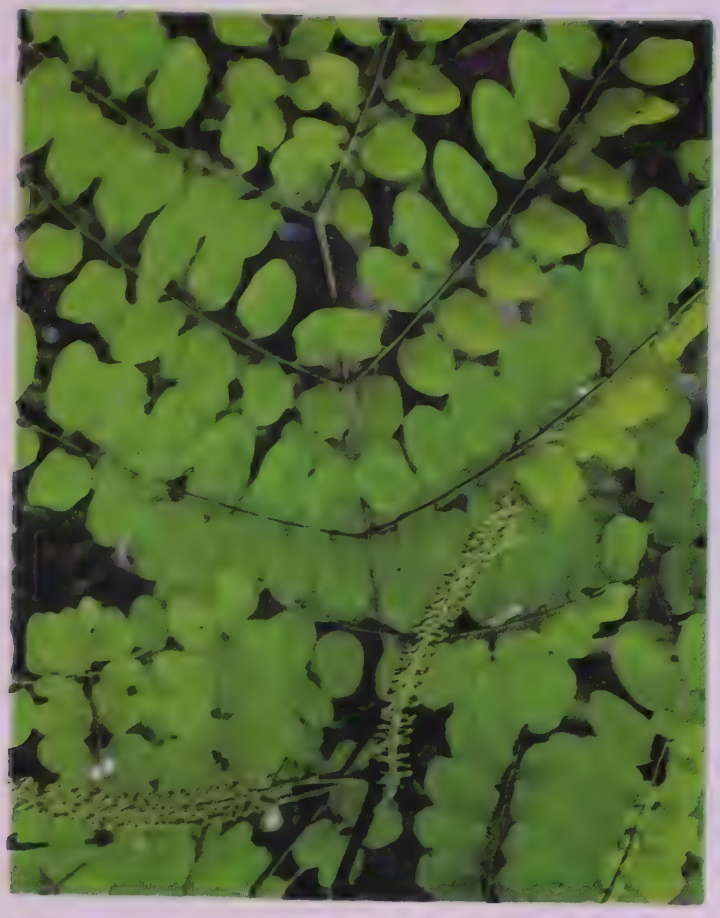
143. *Albizia amara* (Roxb.) Boiv.

Vernacular Names : Sans & Beng : *Krishnasirish*; Tam : *Wunja*.



Occurrence & Distribution : In the dry mixed deciduous forests of south India, in Orissa and Madhya Pradesh.

Description : A moderate sized much-branched tree, with a crooked bole up to 2.4-3.0 m and a girth of 0.6-0.9 m. Bark scaly, rather smooth, grey or



142. *Adenanthera pavonina* L.

144. *Albizia lebbek* (L.) Benth.

146. *Mimosa rubicaulis* Lam.

147. *Mimosa pudica* L.

152. *Butea monosperma* (Lam.) Taub.

154. *Cajanus cajan* (L.) Millsp.

155. *Cicer arietinum* L.

156. *Clitoria ternatea* L.

greenish. Branchlets and leaf-rachis densely pubescent, the latter with a small gland on petiole and between lowest pair of pinnae. Pinnae 6-16 pairs, 2-4 cm long; leaflets 10-30 pairs, sessile, slightly overlapping, linear, very small (1.0-2.5 mm × 3.0-6.0 mm). Flowers borne in peduncled-axillary umbels, yellow. Pods thin, flat, oblong, apiculate, veiny, pubescent, shortly stalked, 12-18 cm × 2.5-3.5 cm. Seeds 10-11, ovate, orbicular, grey.

Flowers in summer and fruits in winter.

Parts Used : Seeds, flowers and leaves.

Therapeutic Uses : *Seeds* : astringent, beneficial in piles, diarrhoea and gonorrhoea; *flowers* : externally applied to inflammatory swelling, boils and ulcers; *leaves* : in conjunctivitis.

Chemical Constituents : Seeds, leaves, bark and wood yield echinocystic and oleanolic acids, 4′-O-methylquercetin-3-rutinoside, β-sitosterol, arabinose, glucose and rhamnose. The fatty acid composition of the seed oil has also been reported (*Wlth India*, 1985, **1A**, 124, CSIR, New Delhi).

144. *Albizia lebbek* (L). Benth.

Vernacular Names : Sans, Hind & Beng : *Sirisha*; Tam : *Vagei*; Eng : East Indian walnut.

शिरीषः कटुकः शीतो विषवातहरः परः ।
पामासृक्कुष्ठकण्डूतित्वग्दोषस्य विनाशकः ॥
(राजनिघण्टु)

śirīṣaḥ kaṭukaḥ śītō viṣavātaharaḥ paraḥ .
pāmāsṛkkuṣṭhakaṇḍūtitvagdōṣasya vināśakaḥ ..
(rājanighaṇṭu)

The plant is *katu*, *sheeta* (*sheetaveerya*), beneficial in poisoning, deranged *vata*, scabies, dyscrasia, leprosy, pruritus and other skin diseases.

Occurrence & Distribution : A road-side tree, common throughout India, from the plains up to 900 m in the Himalayas and also in the Andamans.

Description : A deciduous, erect, spreading tree, 15.2-18.3 m in height. Bark rough, dark-brown to greenish-black with transverse and longitudinal fissures outside and whitish with fine longitudinal striations inside. Leaves bipinnate with 8-18 leaflets. Inflorescence in globose heads of greenish-yellow flowers. Pods yellowish-brown, strap-shaped with 6-10 seeds.

Flowers during rainy season and fruits during winter.

Parts Used : Seeds, leaves and bark.

Therapeutic Uses : *Seeds* and *bark* : astringent, tonic, *leaves* : remedy for night blindness, *root- bark* : powder used to strengthen gums, applied externally as plaster in leprous ulcers.

Chemical Constituents : The seeds are rich in proteins, the amino acid composition of which has been reported. The flowers contain benzyl alcohol, benzoic acid, *p*-nitrobenzoate, α- and β-amyrinsand lupol. The leaves afford caffeic acid, kaempferol, myricitrin, quercetin, reynoutrin, robin, rutin, vicenin-2, and 3β-hydroxy-16-oxo-28-norolean-13(18)-ene whereas the bark yields tannins of condensed type, *viz.*, D-catechin, lebbecacidin (8,3′,4′-tetrahydroxyflavan-3,4-diol), isomers of leucocyanidin (5,7,3′,4′-tetrahydroxyflavan-3,4-diol), (−)-melacacidin (7,8,3′,4′-tetrahydroxyflavan-3,4-diol, in addition to friedelin and β-sitosterol. Lebbecacidin, leucopelargonidin, melacacidin, (−)-2,3-*cis*-3,4-*cis*-3-O-methylmelacacidin as its methyl ether, melanoxetin, 3′-O-methylmelanoxetin, okanin, (+)-pinitol occur in the heartwood. Friedelan-3-one, sitosterol, the saponins-lebbekanins A-H and the sapogenins, *viz.*, albigenin, albiziagenin, albigenic, echinocystic and oleanolic acids have been reported from various parts of the plant (*Tetrahedron*, 1962, **18**, 155; *Indian J. Chem.*, 1977, **15B**, 201; *ibid.*, 1978, **16B**, 1131; *Shoyakugaku Zasshi*, 1977, **31**, 172; *Chem. Abstr.*, 1978, **88**, 148947; *With India*, 1985, **1A**, 124, 126, CSIR, New Delhi).

145. *Entada pursaetha* DC. ssp. *pursaetha* syn. *E. phaseoloides* auct. non (L.) Merr.; *E. scandens*. auct. non (L.) Benth.

Vernacular Names : Hind & Beng : *Gila*; Tam : *Chillu*; Eng : Elephant creeper.

Occurrence & Distribution : Throughout the eastern sub-Himalayan tract, ascending up to 1,200 m in Sikkim, Assam, Bihar and Orissa as well as in the monsoon forests of Eastern and Western Ghats; abundant in the Andamans.

Description : A gigantic climber. Stems angled, twisted. Bark brownish, fibrous, often rough at the base. Leaves bipinnate, long-petioled, ending in a bifid woody tendril. Flowers borne in spikes,small, yellow. Pods woody, jointed, 91-152 cm long and 7.6-10.1 cm broad. Seeds 5-30, orbicular, flat, 5.1 cm across, with lustrous purple or dark brown, horny and tough testa.

Flowers in April and fruits in May.

Parts Used : Seeds, stem and bark.

Therapeutic Uses : *Seeds* : tonic, emetic, antipyretic, anthelmintic; paste applied locally for inflammatory and glandular swellings; *stem* : emetic; *bark* : juice externally applied to ulcers. All of them are poisonous in large doses.

Chemical Constituents : Saponins, *viz.*, entada saponins II and III phaseolidin and sapogenins, *viz.*, oleanolic, echinocystic, entagenic acids, entadamides A and B, α-amyrin, β-sitosterol, 2-hydroxy-, and 2-(α-L-rhamnopyranosyloxy)-benzene methanecamino, O-(β-D-gluycopyranosyl)-L-tyrosine, cysteine, trypsin, monosaturated diolein and dilinolein, triolein, oleodilinolein, trilinolein, myristic, arachidic, behenic and other fatty acids have been reported mainly from the seed and seed-kernel. Cyanidin chloride, quercetin, gallic acid, dopamine-3-O-glucoside, prosapogenin A, β-sitosterol,

lupeol have also been isolated from the seeds (*Arch. Pharm. Berl.*, 1954, **287**, 131; *Chem. Abstr.*, 1954, 11004; *Sci. & Cult.*, 1954, **20**, 199; *Biochem. Physiol. Alkaloid Int. Symp.*, 1972, 113; *Chem. Abstr.*, 1972, **77**, 98695; *J. Indian chem. Soc.*, 1972, **49**, 1199; *Phytochemistry*, 1973, **12**, 2243; *Curr. Sci.*, 1974, **43**, 181; *Indian J. Pharm.*, 1975, **37**, 67; *J. sci. Fd. Agric.*, 1978, **29**, 677; *Chem. Abstr.*, 1979, **90**, 148437; *J. Indian chem. Soc.*, 1978, **55**, 743; *Nutr. rep. Int.*, 1984, **30**, 367; *Chem. Abstr.*, 1984, **101**, 147886; *Chem. Pharm. Bull.*, 1985, **33**,, 5153; *Chem. Abstr.*, 1985, **104**, 213079; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu*, 1985, **27**, 742; *Chem. Abstr.*, 1985, **104**, 213079; *Phytochemistry*, 1987, **26**, 2789; *ibid.*, 1988, **27**, 3259).

146. *Mimosa rubicaulis* Lam.

Vernacular Names : Hind : *Shiah-kanta*; Beng : *Kuchikanta*.

Occurrence & Distribution : All over India, ascending up to 1,000 m in the outer Himalayas.

Description : An erect or straggling shrub, 1.5-3.0 m high with slender grooved, finely grey-downy branches armed with copious, small, scattered, hooked spines. Bark smooth. Wood hard, yellowish-white to red. Leaflets 12-24, membranous, rather downy below, not venulose. Flowers reddish at first and

later white. Pods rather falcate, 7.6-10.2 cm long. Seeds 5-10, with a few distant prickles.

Flowers and fruits during summer and winter.

Parts Used : Leaves and root.

Therapeutic Uses : *Leaves* : infusion useful in piles; crushed leaves applied to burns; *root* : powder given to patients to prevent vomiting.

Chemical Constituents : The plant contains β-amyrin, β-sitosterol and friedelin (*Curr. Sci.*, 1975, **44**, 889).

147. *Mimosa pudica* L.

Vernacular Names : Sans : *Lajjalu*; Hind : *Lajwanti*; Beng : *Lajjabati*; Tam : *Tottalvadi*; Eng : Sensitive plant.

लज्जालुः शीतला तिक्ता कषाया कफपित्तजित् ।
रक्तपित्तमतीसारं योनिरोगान् विनाशयेत् ।।
(द्रव्यगुण)

lajjālu: śītalā tiktā kaṣāyā kaphapittajit .
raktapittamatīsāraṃ yōnirōgān vināśayēt ..
(dravyaguṇa)

The plant is *sheetala* (*sheetaveerya*), *tikta*, *kashaya*; subdues deranged *kapha* and *pitta*; beneficial in haemorrhagic diseases, diarrhoea and gynaecological disorders.

Occurrence & Distribution : Throughout the tropical and subtropical parts of India; common in waste places where the climate is moist and warm.

Description : A diffuse or spreading undershrub, 50-90 cm high. Stem and rachis covered with prickles. Leaves bipinnate, very sensitive, collapse on touching; pinnae 2-4, digitately arranged, with 10-20 pairs of leaflets. Flowers as soft as cotton, borne in pinkish globose heads; peduncle 5.1 cm long. Pods flat, small, straw-coloured, provided with many bristles, 1.3-1.9 cm long. Seeds 3-5.

Flowers and fruits throughout the year.

Parts Used : Leaves and root.

Therapeutic Uses : *Leaves* : juice used in sinus, sores, piles and fistula; paste applied to glandular swellings and hydrocele; *root* : decoction efficaceous in gravel and other urinary complaints.

Chemical Constituents : β-Sitosterol, D-pinitol and norepinephrine, mimosine, crocetin dimethyl ester and tannin have been isolated from the plant. The mucilage from the seeds is composed of D-xylose and D-glucuronic acid (*J. Indian chem. Soc.* 1956, 864; *With India*, 1962, **6**, 382, CSIR, New Delhi; *Indian J. Chem.*, 1973, **11**, 840; *Phytochemistry*, 1973, 191; *Naturwissenschaften*, 1975, **62**, 533).

(C) *Papilionoideae*

148. *Abrus precatorius* L.

Vernacular Names : Sans : *Gunja*; Hind : *Ratti*; Beng : *Kunch*; Tam : *Gundu-mani*; Eng : Crab's Eye.

गुञ्जाद्वयन्तु केश्यं स्यात् वातपित्तज्वरापहम् ।
मुखशोषभ्रमश्वासतृष्णामदविनाशनम् ।।
नेत्रामयहरं वृष्यं वल्यं कण्डूव्रणं हरेत् ।
क्रिमीन्द्रलुप्त कुष्ठानि रक्ता च धवलापि च ।।
शिफा वान्तिकरी पत्रं शूलघ्नं विषहृत्तथा ।।

(द्रव्यगुण)

gunjādvayantu kēśyaṃ syāt vātapittajvarāpaham .
mukhaśōṣabhramaśvāsatṛṣṇāmadavināśanam ..
nētrāmayaharaṃ vṛṣyaṃ valyaṃ kaṇḍūvraṇaṃ harēt .
krimīndralupta kuṣṭhāni raktā ca dhavalāpi ca ..
śiphā vāntikarī patraṃ śūlaghnaṃ viṣahṛttathā ..
(dravyaguṇa)

Both the red and white varieties of the seeds find use as a hair tonic; beneficial in deranged *vata* and *pitta*, fever, xerostomia, vertigo, bronchial asthma, thirst, syncope, opthalmia; aphrodisiac and invigorating; useful in pruritus and ulcer; beneficial in the treatment of worms, alopecia and skin diseases. Roots are emetic and leaves are anticolic and antidotal.

Occurrence & Distribution : Throughout India, ascending up to an elevation of about 1,050 m in the outer Himalayas.

Description : A copiously-branched climbing undershrub. Leaves paripinnate, 16-40 foliolate; leaflets oblong to elliptic. Inflorescence racemose, axillary or terminal, shorter than leaves. Flowers white or with a red tinge. Pods oblong, slightly inflated, fulvo-puberulent. Seeds 3-5, globose or ellipsoid, lustrous, most commonly scarlet with a black spot surrounding the hilum or more rarely white, or black with a white spot.

Flowers in winter and fruits in summer.

Parts Used : Seeds, leaves and root.

Therapeutic Uses : *Seeds* : purgative, emetic, tonic, antiphlogistic, aphrodisiac and used in nervous disorders; abortifacient; paste as local application in stiffness of shoulder joints, sciatica and paralysis; *leaves* : decoction used for cough, cold and colic pain; fresh juice mixed with a bland oil applied to painful swelling; in leucoderma (admixed with *Plumbago zeylanica* root) and in biliousness, itching and other skin diseases; *root* : tonic, diuretic emetic, alexeteric; used in preparation for gonorrhoea, jaundice, haemoglobinuric bile. Leaves and root also used as substitute for liquorice in cattaral affections and cough.

Chemical Constituents : The seeds yield abrins A, B and C, abralin, abrine, hypaphorine, choline, 5β-cholanic acid, trigonelline and its gallic acid ester, precatorine, methylester of N,N-dimethyltryptophan-methocation and several amino acids. The seed-oil contains palmitic, stearic, arachidic, behenic, lignoceric, oleic, linoleic and linolenic acids, cycloartenol, β-amyrin, campesterol, cholesterol, stigmasterol, β-sitosterol, abruquinone, abrectorin, demethoxycentaureidin-7-rutinoside. A monoglucoside anthocyanin, abranin, delphinidin-3,5-diglucoside, pelargonidin-3,5-diglucoside, pelargonidin-3-glucoside, cyanidin-3-glucoside and gallic acid have been reported from the seed coats. Glycyrrhizin and pinitol have been isolated from the leaves and precol, abrol, glycyrrhizin, abrasine and precasine from the seeds. Three isoflavanquinones I, II and III have been isolated from the roots. The leaves, stem and root also contain abrine and other bases mentioned earlier (*Pakist. J. sci. industr. Res.*, 1978, **21**, 158; *Herba Hung.*, 1980, **19**, 21; *Chem. Abstr.*, 1981, **95**, 39109; *Gazz. Chim. Ital.*, 1979, **109**, 9; *Phytochemistry*, 1980, **19**, 2040; *Biochim. biophys. Acta*, 1981, **667**, 397; *Wlth India*, 1985, **1A**, 18, CSIR, New Delhi).

149. *Alhagi pseudalhagi* (Bieb.) Desv.
syn. *A. maurorum* sensu Baker non Desv.; *A. camelorum* Fish.; *Hedysarum pseudalhagi* Bieb.

Vernacular Names : Sans : *Duralambha*; Hind : *Jawasa*; Beng : *Dulal labha*; Tam : *Tulganari*; Eng : Camel thorn.

दुरालम्भा कटुस्तिक्ता सोष्णा क्षाराम्लिका तथा ।
मधुरा वातपित्तघ्नी ज्वरगुल्मप्रमेहजित् ।।

(राजनिघण्टु)

durālambhā kaṭustiktā sōṣṇā kṣārāmlikā tathā .
madhurā vātapittaghnī jvaragulmapramēhajit ..

(rājanighaṇṭu)

It is *katu*, *tikta*, *ushna*, *kshara*, *amla*, *madhura*; subdues deranged *vata* and *pitta*; beneficial in fever, abdominal lump and polyuria.

Occurrence & Distribution : Widely distributed in the Gangetic valley and in the arid zones in Punjab, Rajasthan, Gujarat, Maharashtra and in Bihar at an elevation of 900 m as well as in rocky soil in Kashmir.

Description : A spiny shrub, 30-60 cm high. Leaves drooping, arising from the base of spines, obtuse, oblong, 1.3-3.3 cm long. Flowers red, borne in few-flowered, axillary racemes, forming panicle at the end of branches. Pods falcate or straight, containing 6-8 sub-reniform seeds, 2.5-4.0 cm long.

Flowers during summer and fruits during winter.

Parts Used : Whole plant, flowers, twigs and root.

Therapeutic Uses : *Whole plant* : laxative, diuretic, antiseptic, expectorant, antibilious; infusion diaphoretic; *flowers*, *twigs* : used for fumigation for piles; *twigs* : decoction used in the treatment of cough in children; *leaves* : oil for rheumatism; *root* : decoction for swellings and abscesses.

Chemical Constituents : β-Phenylethylamine, N-methyl-β-phenyl-ethylamine, N-methyltyramine, hordenine, 3,4-dihydroxy-β- phenethyltrimethyl-ammonium hydroxide, 3-methoxy-4-hydroxy-β-phenyltrimethylammonium hydroxide, N-methyl mescaline and salsolidine have been obtained from the twigs. The plant also contains choline, betaine, tannins, flavonoids (mainly rutin

and quercetin), coumarin derivatives, ascorbic acid, a neutral proteinase-alhagain, 24-methylcholest-5-en-3-β-ol, 24-ethylcholest-5-en-3-β-ol, 24-ethylcholest-5, 22-dien-3-β-ol, 24-ethylcholest-5, 24(28)-dien-3-β-ol, 24-ethyl-cholest-7-en-3-β-ol and Δ^7-avenasterol (*Chem. Abstr.*, 1975, **82**, 152215; *Ital. J. Biochem.*, 1979, **26**, 181; *Curr. Sci.*, 1981, **50**, 485; *Wlth India*, 1985, **1A**, 160, CSIR, New Delhi).

150. *Arachis hypogaea* L.

Vernacular Names : Sans : *Buchanaka*; Hind : *Mungphali*; Beng *Chinabadam*; Tam : *Varkadalai*; Eng : Groundnut.

Occurrence & Distribution : Widely cultivated for its pods in Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal.

Description : A prostrate, diffuse or erect, branched, annual herb, 30-60 cm high. Leaves bipinnate, alternate with adnate stipules; leaflets oval to oval-obovate, 3.5-5.0 cm x 2.0-2.5 cm. Flowers yellow, axillary, ephemeral, borne above the ground. Pods hard, indehiscent, inflated, reticulated, 2.5-5.0 cm long, 1-3 seeded with the pericarp constricted between the seeds. Seeds covered by a light or deep reddish-brown seed coat and consist of two white fleshy cotyledons.

Flowers during rainy season and fruits during winter.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : laxative; oil, aperient and emollient.

Chemical Constituents : The main constituents of the kernel are protein, lipids, reducing sugars, disaccharides, starch and pentosans. The reported vitamins are biotin, choline, folic acid, inositol, nicotinic, pantothenic, pteroyl glutamic acids, pyridoxine, riboflavine, thiamine, carotene, vitamins A and K and tocopherols. The chief proteins in the groundnuts are arachin and conarachin, the amino acid compositions of which have been reported. Free amino acids present are glutamic and aspartic acids, asparagine, phenylalanine and histidine. γ-Methylene-L-glutamine, γ-methylene-L-glutamic acid, peptides 1 and 2,γ-glutamyl glycine, γ-glutamyl-L-phenylalanine and γ-glutamyl-L-tyrosine, xanthine, guanine, adenine, glutathione, pinitol, tannin, phlobaphene, leucoanthocyanin and a flavone are also present in the kernel. The cold pressed oil of the kernel contains glycerides of oleic, linoleic, palmitic, stearic, arachidic, eicosenoic, behenic, lignoceric, myristic, hexacosanoic, erucic, caprylic, lauric as well as trace amounts of odd carbon fatty acids. The unsaponifiable matter includes campesterol, stigmasterol, β-sitosterol and its glucoside, cholesterol, β-amyrin, cycloartenol, 24-methylene cycloartenol, α- and γ-tocopherols, squalene, hypogene and arachidene. The volatile constituents of the roasted kernels include hydrocarbons, alcohols, carbonyl compounds, acids, esters, pyrazines and other components comprising more than 200 compounds. Citrinin has been found in the groundnut. Toxic compounds *viz.*, aflatoxin B_1, B_2, G_1 and G_2 have been shown to be associated with mould-infected groundnuts. The red skin (episperm) of groundnut kernel contains arachidoside. The amino acid composition of the leaf protein has been analysed. Sapogenins have been reported from the groundnut germs. The root nodules are rich in riboflavin, arginine, asparagine, glutamine and arginine. The roots and aerial parts contain pterocarpanoids (*Wlth India*, 1985, **1A**, 356, CSIR, New Delhi).

151. *Astragalus candolleanus* Royle ex Benth. syn. *A. anomalus* Bunge

Vernacular Names : Sans, Hind & Beng : *Rudanti**.

It is a remedy for emaciation; *tikta*, *ushna*, *tuvara* (*kashaya*); rejuvenating; pacifies deranged *tridosha* and efficacious in tuberculosis.

रुदन्ती शोषघ्नी तिक्तोष्णा तुवरा परम् ।
रसायनं त्रिदोषघ्नी राजयक्ष्मणि शस्यते ।।
(द्रव्यगुण,पि. वि. शर्मा)

rudantī śōṣaghnī tiktōṣṇā tuvarā param .
rasāyanaṃ tridōṣaghnī rājayakṣmaṇi śasyatē ..
(dravyaguṇa,pi. vi. śarmā)

Occurrence & Distribution : Kashmir, Simla, Garhwal and hilly regions of Kumaon. Also grows at Gangotri and Kedarnath at an altitude of 3,000-4,500 m.

Description : A low compact clump-forming undershrub, armed with long woody spines formed from rachis of old leaves. Leaves pinnate, leaflets tiny,

Cressa cretica L. (Convolvulaceae) is also known by the same name in Sanskrit.

oblong-ovate. Flowers yellow, 1.5-2.5 cm long, in dense stalkless clusters. Calyx often reddish, covered with densely silky-hairs. Pods curved, with spreading silky hairs.

Flowers in May-June and fruits in June-August.

Parts Used : Whole plant and root.

Therapeutic Uses : *Whole plant* : in the treatment of cough, respiratory troubles and loss of vitality; *root* : decoction and powder internally given in cough, tuberculosis and skin diseases.

152. *Butea monosperma* (Lam.) Taub.
syn.; *B.frondosa* Koenig ex Roxb.; *Erythrina monosperma* Lam.

Vernacular Names : Sans : *Palasha*; Hind & Beng : *Palash*; Tam : *Parasa*; Eng : Flame of the forest.

पलाशस्तु कषायोष्णः क्रिमिदोषविनाशनः ।
तद्बीजं पामा कण्डूतिदद्रूत्वग्दोषनाशकृत् ।।
तस्य पुष्पं च सोष्णञ्च कण्डूकुष्ठार्त्तिनाशनम् ।

(राजनिघण्टु)

palāśastu kaṣāyōṣṇa: krimidōṣavināśana: .
taduījaṃ pāmā kaṇḍūtidadrūtvagdōṣanāśakṛt ..
tasya puṣpaṃ ca sōṣṇañca kaṇḍūkuṣṭhārttināśanam .

(rājanighaṇṭu)

It is *kashaya*, *ushna* and anthelmintic; seeds are beneficial in scabies, pruritus, ring worm and other skin diseases; flowers are *ushna*; useful in pruritus and skin diseases.

Occurrence & Distribution : Throughout India, up to 1,219 m except arid tracts. Grows gregariously in open grasslands and scattered in mixed forests.

Description : A deciduous tree, up to 15 m in height and 1.5-1.8 m in girth, with a crooked trunk. Bark light-brown or bluish- grey, yielding a ruby-red vitreous gum (called '*Butea* gum' or 'Bengal kino'). Wood white or yellowish-brown, often becoming grey or greyish-brown. Leaves 3-foliolate, large, unequal, 10.2- 20.4 cm. Flowers borne in racemes, brilliant orange-red, 3.8-5.1 cm long. Lower calyx-teeth deltoid. Pods silvery-white, broad, dehiscing by one suture. Seeds flat, elliptic, reddish-grey, 3.2 cm.

Flowers in March-April and fruits in May-June.

Parts Used : Seeds, flowers, leaves and bark.

Therapeutic Uses : *Seeds* : anthelmintic; useful in flatulence and piles; *flowers* : diuretic, depurative, astringent and aphrodisiac; *leaves* : aphrodisiac and used as febrifuge; *bark* : the exuded gum (*Butea* gum) is used as an astringent; beneficial in diarrhoea and dysentery.

Chemical Constituents : Flowers yield butin and its 7-glucoside (isocoreopsin), and 3-β-D-glucoside (monospermoside), butein (major glucoside), isomonospermoside, coreopsin, sulphurein, palasitrin in addition to butrin and isobutrin; the chalcone and aurones are responsible for the bright colour. The gum from the bark (*Butea* gum) furnishes leucocyanidin and its tetramer (procyanidin), riboflavin and thiamine. Glycine, a glycoside and an aromatic hydroxy compound have been isolated from the roots. Apart from lipolytic and proteolytic enzymes, the occurrence of monospermin [1-N-acetyl-2- oxo-4-methoxy-3H, 5H-imidazole], δ-lactone of *n*-heneicosanoic acid, (–)-palasonin and its methylester have been reported. The fatty acid composition of the seed oil is myristic, palmitic, stearic, arachidic, behenic, lignoceric, oleic, linoleic and linolenic acids. The unsaponifiable part of the oil contains β-sitosterol and its β-D-glucoside and α-amyrin. Some of them are common with the oil constituents of the flowers. Jalaric esters I and II and laccijalaric esters III and IV have been reported from the roots (*Helv. Chem. Acta*, 1974, **57**, 32; *Tetrahedron*, 1974, **30**, 867; *Wlth India*, 1988, **2B**, 343, CSIR, New Delhi).

153. *Butea superba* Roxb.

Vernacular Names : Sans & Beng : *Latapalasha*; Hind : *Palas lata*; Tam : *Kodi murukkam.*

Occurrence & Distribution : A climber in the hilly forests of central and South India. Also found wild in forests over a large part of the country from Oudh eastwards through Bihar and West Bengal to Assam.

Description : An extensive woody climber, 90 cm in girth. Leaves and flowers nearly of the same length. Flowers in gorgeous orange-scarlet racemes on leafless branches. Pods 12.5-15 cm long.

Flowers in March and fruits in October.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : sedative and anthelmintic; decoction used externally for piles; *leaves* : juice mixed with curd and zedoary (*Curcuma aromatica*) beneficial in heat eruptions in children.

Chemical Constituents : Flowers contain butrin, butein and butin. Two glycosides are also reported from the roots (*Wlth India*, 1988, **2B**, 347, CSIR, New Delhi).

154. *Cajanus cajan* L. Millsp. syn. *C. indicus* Spreng. *C. obcordifolia* Singh; *Cytisus cajan* L.

Vernacular Names : Sans : *Adhaki*;Hind & Beng : *Arhar*; Tam : *Thovary*; Eng : Pigeon pea.

आढकी तुवरा रुक्षा मधुरा शीतला लघुः ।
ग्राहिणी वातजननी वर्ण्या पित्तकफास्रजित् ।।
(द्रव्यगुण)

ādhakī tuvarā rukṣā madhurā śītalā laghuḥ .
grāhiṇī vātajananī varṇyā pittakaphāsrajit ..
(dravyaguṇa)

It is *tuvara* (*kashaya*), *ruksha*, *madhura*, *sheetala* (*sheetaveerya*), *laghu*; astringent and aggravates *vata*; improves the brightness of the skin; useful in deranged *pitta*, *kapha* and dyscrasia.

Occurrence & Distribution : Cultivated mainly as a pulse-crop throughout India.

Description : An annual or perennial shrub, 1.2-3.0 m in height. Branches soft as wool, grey. Leaves trifoliolate. Flowers yellow, short-peduncled. Pods obliquely acute, 5.1-7.6 cm long and 0.6 - 0.8 cm broad. Seeds 3-5, somewhat compressed.

Flowers in July and fruits during winter.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : nutritious; *leaves* : expressed juice with a little salt given in jaundice.

Chemical Constituents: Oxalic acid, succinic acid, sucrose, 5-methyl-L-cysteine, valine and isoleucine, phenylalanine, lysine, histidine, alkanes, esters, alcohols, β-sitosterol and its glucoside, stigmasterol, campesterol, cholesterol, cajaflavanone, aphytoalexin-cajanol (5,4′-dihydroxy-7, 2′-dimethoxyisoflavanone), 2′-O-methylcajanone, 5,2′-dihydroxyisoflavone-7-O-β-D-glucoside, genistein, lupeol, α- and β-amyrins and anthraquinone-cajaquinone, have been reported (*Proc. nat. Acad. Sci. India*, 1973, **43A**, 268; *Quat. Plant Foods Hum. Nutro.*, 1975, **24**, 257; *Chem. Abstr.*, 1975, **83**, 95133; *Nutr. Improv. Food legumes Breed. Proc. Symp.*, 1972, 193; *Chem Abstr.*, 1976, **85**, 43725; *Collect. Czech. Chem Commun.*, 1977, **42**, 2448; *Phytochemistry*, 1978, **17**, 2045; *ibid.*, 1979, **18**, 365, 693; *Z. Naturforsch.*, 1979, **34C**, 159; *Chem. Abstr.*, 1979, **90**, 164736; *Indian J. Chem.*, 1979, **17B**, 88).

155. *Cicer arietinum* L.

Vernacular Names : Sans : *Chanaka*; Hind : *Chana*; Beng : *Chhola*; Tam : *Kadalai*; Eng : Bengal gram.

चनको मधुरो रुक्षो मेहजित् वातपित्तकृत् ।
दीप्तिवर्णकरो वल्यो रुच्यश्चाध्मानकारकः ।।
(राजनिघण्टु)

canakō madhurō rukṣō mēhajit vātapittakṛt .
dīptivarṇakarō valyō rucyaścādhmānakāraka: ..
(rājanighaṇṭu)

It is *madhura, ruksha*; cures polyuria; excites *vata* and *pitta*; brightens complexion; invigorating, appetizing and causes flatulence.

Occurrence & Distribution : Cultivated throughout India as a pulse-crop.

Description : An erect or spreading much-branched, annual herb, 30.5-61.0 cm in height, all parts covered with glandular hairs. Leaves pinnately compound; leaflets oval, small, toothed, rachis ending in a tendril; stipules foliaceous. Pods oblong, 1.9-2.5 cm long, 1-2 seeded.

Flowers in February-March and fruits in April-June.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : nutritive; astringent and antibilious; diuretic when fried; roasted pulse used as aphrodisiac; *leaves*: applied to sprains and dislocated limbs; juice is stomachic and laxative.

Chemical Constituents : Oxalic, acetic and malic acids, amino acids, vitamins A, D, E, 5,7-dihydroxy-4-methoxy isoflavone, 7-hydroxy-4′-methoxyflavone, lecithin, phytins, saponin, vanillic and *p*-hydroxy-benzoic acids and formononetin have been reported. The seedlings afforded isoliquiritigenin and its 4′-glucoside, 3,4′, 7- trihydroxyflavone, diadzein, pratensein, *p*-coumaric acid, garbenzol and biochanin-7-glucoside. Biochanins A, B and C have been isolated from the sprouting gram (*Glossary of Indian Medicinal Plants*, ed. R.N. Chopra, *et al*, 1956, 63; Suppl., 1969, 15, CSIR, New Delhi; *Phytochemistry*, 1965, **4**, 89; *Indian J. Anim. Sci.*, 1975, **45**, 622; *Chem. Abstr.*, 1977, **87**, 65305; *Indian J. expl. Biology*, 1978, **16**, 1213).

156. *Clitoria ternatea* L.

Vernacular Names : Sans, Hind & Beng : *Aparajita*; Tam : *Kakkanam.*

अपराजिते कटू मेध्ये शीते कण्ठ्ये सुदृष्टिदे ।
कुष्ठमूत्रत्रिदोषामशोथव्रणविषापहे ।।
कषाये कटुके पाके तिक्ते च स्मृतिवुद्धिदे ।।
(भावप्रकाश)

aparājitē kaṭū mēdhyē śītē kaṇṭhyē sudṛṣṭidē .
kuṣṭhamūtratridōṣāmaśōthavraṇaviṣāpahē ..
kaṣāyē kaṭukē pākē tiktē ca smṛtivuddhidē ..
(bhāvaprakāśa)

Both the varieties of *Aparajita* are *katu*, *sheeta* (*sheetaveerya*), *kashaya*, *katuvipaka*, *tikta*; considered to be a good brain tonic, useful in throat and eye affections, skin diseases, urinary troubles, *tridosha*, *ama*, oedema, ulcer; antidotal; improve memory and intelligence.

Occurrence & Distribution : Almost throughout India, wild or cultivated. Grown in hedges or on walls.

Description : A perennial climber. Leaves pinnately 3-7 foliolate. Flowers showy, blue or white. Petals unequal. Style bearded below the stigma. Pods linear, compressed. Seeds 6-10, black.

Flowers in rainy season and fruits in winter.

Parts Used : Seeds and root.

Therapeutic Uses : *Seed* : powerful purgative; *root* : cathartic and diuretic.

Chemical Constituents : The leaves yield a δ- lactone, aparajitin. Taraxerol, taraxerone, α- sitosterol, β-sitosterol, stearic, palmitic, oleic, linoleic and linolenic acids, ternatins A-F, 3,5,7, 4′-tetrahydroxyflavone-3-rhamnoglycoside, ethyl α-D-galactopyranoside, *p*-hydroxycinnamic acid, polypeptide, hexacosanol, an anthoxanthin, kaempferol, kaempferol-3-glycosides, robinin, quercetin, and quercetin-3-glucoside, malvidin-3β-glucoside, delphinidin-3β-glucoside and 3′-methyl ether of delphinidin-3β-glucoside and stigmast-4-en-3,6-dione have been reported from the plant (*J. Indian chem. Soc.*, 1959, 243; *Curr. Sci.*, 1960, **29**, 180; *ibid.*, 1967, **36**, 124; *Bull. Calcutta Sch. Trop. Med.*, 1963, **11**, 106; *ibid.*, 1964, **12**, 23; *Chem. Ber.*, 1968, **101**, 2096; *J. Oil Technol. Assoc.* India, 1975, **7**, 26; *Pharmazie*, 1978, **33**, 82; *Chem. Abstr.*, 1978, **88**, 186110; *Indian J. Pharm.*, 1968, **30**, 167; *Indian J. Chem.*, 1973, **11**, 89; *Planta med.*, 1977, **32**, 138; *Phytochemistry*, 1985, **24**, 1583).

157. *Crotalaria juncea* L.

Vernacular Names : Sans : *Sana*; Hind : *Sannai, sunn*; Beng : *Shonpat*; Tam : *Sanal*; Eng : Sunn hemp.

शणस्त्वम्लः कषायश्च मलगर्भास्रपातनः ।
वान्तिकृत् वातकफ्नुत् ज्ञेयस्तीव्रांगमर्दजित् ।।
(राजनिघण्टु)

śaṇastvamlaḥ kaṣāyaśca malagarbhāsrapātanaḥ .
vāntikṛt vātakaphanut jñēyastīvrāṅgamarddajit ..
(rājanighaṇṭu)

It is *amla*, *kashaya*, laxative and abortifacient; causes bleeding, emetic, pacifies deranged *vata* and *kapha*; cures severe bodyache.

Occurrence & Distribution : One of the most commonly cultivated crops in India, ranking next to jute in importance as a bast- fibre crop.

Description : An erect, rigid, annual undershrub, 1.22-3.05 m tall. Branchlets grooved and rounded. Leaves simple, obtuse-acute, subsessile and narrow. Flowers large and bright yellow. Pods sessile and thick-skinned, each containing 10-15 seeds.

Flowers in rainy season and fruits during winter.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : in impetigo, psoriasis; emmenagogue.

Chemical Constituents : The fatty acid composition of the seed oil has been reported. Apigenin-7-glucuronide, apigenin-7, 4′-O-diglucoside, α-hydroxy-norleucine and galactomannan from the seeds. Senecionine also occurs in the plant (*Phytochemistry*, 1970, **9**, 2581; *Medicinal Plants of India*, ed. G.V. Satyavati *et al.*, 1976, **1**, 295, ICMR, New Delhi; *Phytochemistry*, 1979, **18**, 320; *Indian J. Chem.*, 1979, **18B**, 59).

158. *Crotalaria verrucosa* L.

Vernacular Names : Sans : *Shanapushpi*; Hind : *Jhunjhunia*; Beng *Jhanjhana*; Tam : *Vittakillu.*

शणपुष्पी रसे तिक्ता कषाया कफवातजित् ।
अजीर्णज्वरदोषघ्नी वमनी रक्तदोषनुत् ।।
(राजनिघण्टु)

śaṇapuṣpī rasē tiktā kaṣāyā kaphavātajit .
ajīrṇajvaradōṣaghnī vamanī raktadōṣanut ..
(rājanighaṇṭu)

It is *tikta*, *kashaya*; pacifies deranged *kapha* and *vata*; beneficial in indigestion and fever; emetic; cures dyscrasia.

Occurrence & Distribution : Grows throughout the tropical regions of the country, especially in South India.

Description : Crooked or straight undershrub, 5.1-7.6 cm high. Branches densely clustered at the base, but sparsely at the top. Leaves simple, elliptic-lanceolate, thin, soft, 10.2-15.2 cm. Flowers blue, white or yellow. Pods pubescent or velvety, 2.5-3.8 cm long. Seeds 10-12.

Flowers and fruits in winter.

Part Used : Leaves.

Therapeutic Uses : *Leaves* : in scabies, impetigo and diminishes salivation.

Chemical Constituents : Seeds contain β-sitosterol, vitexin, vitexin-4′-xyloside, vitexin-O-glycoside, apigenin-O-glycoside, isovitexin, crotalaburnine, isosenkirkine, O-acetylisosenkirkin, crotaverrine and O-acetyl crotaverrine, kaempferol-7, 4′-di-O-L-rhamnopyranoside has been obtained from the flowers. A new 'necic' acid lactone, 2-methyl-3-(2-oxo-[5H]-hydroxymethyl-5-methyl

furan-3-yl) propanoic acid has been reported from the leaves (*Indian J. Pharm.*, 1967, **29**, 311; *ibid.*, 1972, **34**, 168; *Phytochemistry*, 1976, **15**, 1061; *Fitoterapia*, 1985, **56**, 175; *J. nat. Prod.*, 1989, **52**, 178).

159. *Dalbergia sissoo* Roxb.

Vernacular Names : Sans : *Shinshapa*; Hind & Beng : *Sishu*; Tam : *Sisu itti*; Eng : Sissoo.

शिंशपा कटुका तिक्ता कषाया शोषहारिणी ।
उष्णवीर्या हरेन्मेदः कुष्ठश्वित्रवमिक्रिमीन् ।।
वस्तिरुग्व्रणदाहास्रवलासान् गर्भपातिनी ।।
(भावप्रकाश)

śiṃśapā kaṭukā tiktā kaṣāyā śōṣahāriṇī .
uṣṇavīryā harēnmēdaḥ kuṣṭhaśvitravamikrimīn ..
vastirugavraṇadāhāsravalāsān garbhapātinī ..
(bhāvaprakāśa)

It is *katu*, *tikta*, *kashaya* and *ushnaveerya*; helps to arrest emaciation, reduces obesity; efficacious in the treatment of leucoderma and other skin diseases; antiemetic and anthelmintic; cures urinary diseases, dyscrasia and ulcer; alleviates burning sensation; expectorant; abortifacient.

Occurrence & Distribution : Western Himalayas up to 1,500 m. Extensively planted along roadsides in different parts of India.

Description : A tall deciduous tree, 15.2-18.3 m in height. Wood extremely hard. Branches grey, downy, spreading. Leaves imparipinnate; leaflets roundish, 3-5 pairs. Flowers borne in axillary panicles, yellowish-white. Pods thin, strap-shaped, 6-8 times as long as broad, pale grey.

Flowers in summer and fruits in winter.

Parts Used : Leaves, bark, wood and root.

Therapeutic Uses : *Leaves* : stimulant; decoction beneficial in gonorrhoea; *mucilage* mixed with oil useful in excoriations; *bark* : alterative; dried bark; haemostatic; efficacious in bleeding piles, menorrhagia and in varicose veins; *wood* : alterative and antiemetic; oil derived from the wood applied externally in skin diseases; *root* : astringent.

Chemical Constituents : Dalbergin, dalbergenone, methyl dalbergin, 5,7-dihydroxy-4′-methoxyisoflavone, 3,5-dihydroxystilbene, 7-methoxy-6-hydroxy-4-phenylchrom-3-one, nordalbergin, isodalbergin, dalbergiphenol, tectorigenin, isotectorigenin, isocaviudin, caviunin-7-O-glucoside and 7-O-gentiobioside, isocaviunin, isocaviunin-7-gentiobioside have been obtained. Essential oil from the wood contains bisaboline and nerolidol. Biochannin A and its 7-glucoside,5,4′-dihydroxy-6,7-dimethoxyisoflavone (7-O-methyltectorigenin), 5-hydroxy-6,7,4′-trimethoxyisoflavone and 7-hydroxy-4-methyl coumarin have also been reported (*Indian Soap J.*, 1952, **17**, 285; *Indian J. Chem.*, 1963, **1**, 25; *ibid.*, 1965, **3**, 474; *Curr. Sci.*, 1966, **34**, 431; *J. Indian acad. Wood Sci.*, 1970, **1**, 3; *Tetrahedron*, 1971, **27**, 799; *Indian J. Chem.*, 1974, **12**, 10, 1118; *J. Indian acad. Wood Sci.*, 1975, **6**, 57, 59; *Phytochemistry*, 1979, **18**, 1253; *ibid.*, 1980, **19**, 715; *Indian J. Chem.*, 1980, **19B**, 237).

160. *Derris trifoliata* Lour. syn. *D. uliginosa* Benth.; *Robinia uliginosa* Willd.

Vernacular Names : Hind & Beng : *Panlata*.

Occurrence & Distribution : Along the seacoasts of Maharashtra, Tamil Nadu, Orissa, Sunderbans and Andamans.

Description : A large, evergreen, glabrous, climbing shrub. Root- bark pale grey but stem-bark deep grey. Leaves alternate, odd-pinnate, 5.1-10.2 cm long,

arising from the base of younger branches; flowers rose-red, 0.9 cm long. Pods obtuse, suborbicular, winged only at the upper suture, glabrous. Seeds 1-2, slightly spherical, 3.8 cm long.

Flowers in rainy season and fruits in winter.

Part Used : Root-bark.

Therapeutic Uses : *Root-bark* : alterative and insecticide; beneficial in rheumatism and dysmenorrhoea.

Chemical Constituents : Rotenone, dehydrorotenone, α- and β-amyrins, lupeol, oleanolic and ursolic acids, betulin, cholesterol, campesterol, β-sitosterol, stigmasterol, stigmast-7-en-3β-ol, 3-O-β-neohesperidosides of quercetin and rhamnetin have been obtained (*Malay. agric. J.*, 1938, 18; *Chem. Abstr.*, 1938, **32**, 7653; *Indian J. Chem.*, 1976, **14B**, 1012; *Phytochemistry*, 1985, **24**, 1725; *J. nat. Prod.*, 1986, **49**, 710).

161. *Desmodium gangeticum* (L.) DC.
syn. *Hedysarum gangeticum* L.

Vernacular Names : Sans : *Shalaparni*; Hind : *Salwan*; Beng : *Salpani*; Tam : *Pulladi*.

शालिपर्णी रसे तिक्ता गुरुष्णा वातदोषनुत् ।
विषमज्वरमेहार्शः शोफस्सन्तापनाशिनी ।।

(राजनिघण्टु)

157. *Crotalaria juncea* L.

159. *Dalbergia sissoo* Roxb.

163. *Dolichos lablab* L.

164. *Erythrina variegata* L.

165. *Glycine max* (L.) Merr.

168. *Indigofera tinctoria* L.

169. *Lathyrus sativus* L.

170. *Lens culinaris* Medic.

śāliparṇī rasē tiktā guruṣṇā vātadōṣanut .
viṣamajvaramēhārśa: śōphasantāpanāśinī ..
(rājanighaṇṭu)

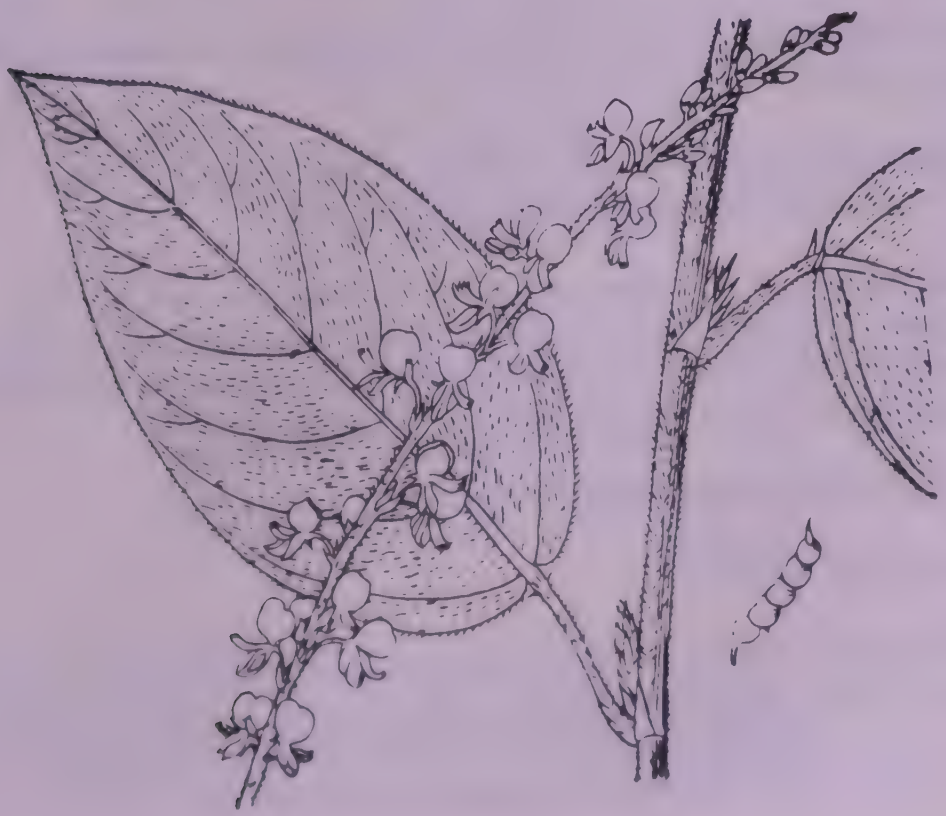
It is *tikta, guru, ushna; beneficial in deranged vata*; cures malaria, polyuria, piles, oedema and allays burning sensation.

Occurrence & Distribution : In the lower Himalayan regions up to 1,600 m and throughout the plains of India.

Description : A herb or an undershrub, 61-122 cm in height. Stems simple and straight. Leaves 1-foliolate, 7.6-15.2 cm long and 0.8-1.3 cm broad; leaflets entire, membranous or subcoriaceous, glabrescent on the upper surface. Racemes lax; flowers small. Pods 6-8 in a cluster, glabrescent, sticky, 1.3-1.9 cm long.

Parts Used : Whole plant and root.

Therapeutic Uses : *Whole plant* : febrifuge; digestive and bitter tonic; *root* febrifuge and anticatarrhal; one of the ingredients of the well known Ayurvedic preparation, *Dashamoola kwaatha* used in post-natal care to avoid secondary complications.



Chemical Constituents : It contains N,N-dimethyltryptamine, 5- methoxy-N, N-dimethyltryptamine, and their N_b-oxides, N_b-methyltetrahydroharman, 6-methoxy-2-methyl-β-carbolinium derivative, hypaphorine, hordenine, caudicine, N-methyl tyramine, β-phenylethylamine, gangetin- (7,12α-dihydro-13-methoxy-3, 3-dimethyl-11-13-methyl-2-butenyl)-3H, 7H-benzofuro [3,2-c] pyrano [3,2-g]-benzpyran-10-ol, gangetinin, desmodin, 24-ethylcholesta-5, 22-dien-3β-ol,24-ethylcholesta-5-en-3β-ol and 24-methycholesta-5-en-3β-ol (*Planta med.*, 1972, 434; *Phytochemistry*, 1975, **14**, 1129; *Indian Drugs*, 1986, **23**, 434).

162. *Dolichos biflorus* L.

Vernacular Names : Sans : *Kulattha*; Hind : *Kulthi*; Beng : *Kurti-kalai*; Tam : *Kollu*; Eng : Horsegram.

कुल्त्थिका कटुस्तिक्ता स्यादर्शःशूलनाशनी ।
विवन्धाध्मानशमनी चक्षुष्या व्रणरोपणी ।।
(राजनिघण्टु)

kulatthikā kaṭustiktā syādarśa:śūlanāśanī .
vivandhādhmānaśamanī cakṣuṣyā vraṇarōpaṇī ..
(rājanighaṇṭu)

It is *katu*, *tikta*; beneficial in piles, colic, epistasis, flatulence, ophthalmia and healing of ulcer.

Occurrence & Distribution : Widely in various parts of India. Cultivated chiefly in Andhra Pradesh, Karnataka and Tamil Nadu.

Description : A trailing or sub-erect branched annual herb. Leaves trifoliolate; ovate-lanceolate, 2.5-5.1 cm long. Flowers borne in clusters of 1-3, generally arising from the base of leaves. Pods flat, narrow, curved, tipped with a persistent style, 3.8-5.1 cm long. Seeds 5-6, ellipsoid, flattened.

Flowers in August and fruits in September.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : astringent, diuretic, tonic; powder used as antidiaphoretic; decoction beneficial in leucorrhoea, menstrual troubles and in combination with milk acts as an anthelmintic; soup prepared from pulses is an useful diet in sub-acute cases of enlarged liver and spleen.

Chemical Constituents : The seeds yield 5-hydroxy-7,3′, 4′-trimethoxy-8-methylisoflavone-5-neohesperidoside, genistein, 2′-hydroxy-genistein, dalbergioidin, kievitone, phaseollidin, isoferreirin, coumesterol, psoralidin, β-sitosterol and 5-O-α-L-rhamnopyranosyl (1→2)-O-β-D-gluco-pyranoside. Dolichin A and dolichin B have been obtained from bacteria treated leaves (*Bull. Calcutta sch. trop. med.*, 1955, **3**, 109; *Z. Naturforsch.*, 1980, **35C**, 923; *Phytochemistry*, 1981, **20**, 807; *ibid.*, 1983, **22**, 1063).

163. *Dolichos lablab* L.

Vernacular Names : Sans : *Madhusarkara*; Hind : *Sem*; Beng : *Makhan-sim*; *Avarai*; Eng : Indian butter bean.

मधुशर्करा सुरुच्या मधुरात्पकषायका ।
शिशिरा वातला वल्याप्याध्माना गुरु पुष्टिदा ।।
(राजनिघण्टु)

madhuśarkarā surucyā madhurālpakaṣāyakā .
śiśirā vātalā valyāpyādhmānā guru puṣṭidā ..
(rājanighaṇṭu)

It is a good appetizer, *madhura*, slightly *kashaya*, *shishira* (*sheetaveerya*), excites *vata*; invigorating; causes flatulence; *guru* and nutritive.

Occurrence & Distribution: Cultivated throughout India.

Description : A perennial but usually cultivated as an annual creeping or twining herb. Leaves trifoliolate. Flowers borne in axillary racemes, reddish, purple or white. Pods flat or inflated, broad or linear, incurved with remains of style, 2.5-12.7 cm long. Seeds 5-7, globose, ovate or flattened, white to dark black.

Flowers in November and fruits in December.

Parts Used : Pods and seeds.

Therapeutic Uses : *Pods* : beneficial in nasal haemorrhage; *seeds* : febrifuge, stomachic and aphrodisiac.

Chemical Constituents : The seed oil yields large amount of linoleic, palmitic, oleic and linolenic acids. Myoinositol, D(+) pinitol, galactinol, D-α-amino-*n*- butyric acid and 3-O-β-D- glucopyranosyl gibberellin A_1 have also been reported from this plant (*Agric. biol. Chem.*, 1976, **40**, 1661; *ibid.*, 1978, **42**, 481; *Chem, Abstr.*, 1979, **90**, 19031; *Aust. J. Chem.*, 1977, **30**, 1583; *Riv. agric. Subtrop. Trop.* 1978, **72**, 101; *Chem. Abstr.*, 1989, **91**, 105178).

164. *Erythrina variegata* L. var. *orientalis* (L.) Merr. syn. *E. indica* Lam.; *E. mysorensis* Gamble

Vernacular Names : Sans : *Paribhadra*; Hind : *Mandara*; Beng : *Palita-mandar*; Tam : *Kaliyanamurukku*; Eng : Indian Coral Tree.

पारिभद्रः कटूष्णः स्यात् कफवातनिकृन्तनः ।
अरोचकहरः पथ्यो दीपनश्चापि कीर्त्तितः ।।

(राजनिघण्टु)

pāribhadraḥ kaṭūṣṇaḥ syāt kaphavātanikṛntanaḥ .
arōcakaharaḥ pathyō dīpanaścāpi kīrttitaḥ ..

(rājanighaṇṭu)

It is *katu*, *ushna*, subdues deranged *kapha* and *vata*; cures anorexia; a diet and gastric stimulant.

Occurrence & Distribution : Wild in deciduous forests throughout India as well as in the Andamans. Frequently cultivated in gardens as an ornamental tree.

Description: A medium-sized quick-growing tree, attaining a height of 18.3 m, armed with black prickles. Bark smooth, greenish or yellowish, lustrous, peeling off in thin papery flakes. Leaves trifoliolate; leaflets 10.2-15.2 cm long and nearly as broad. Flowers large, borne in dense racemes, coral red. Pods torulose, 15.2-25.4 cm long. Seeds 6.8, oblong, smooth, red to dark purple or brown, 2.5 cm long.

Flowers in February-March and fruits in June-July.

Parts Used : Bark and Leaves.

Therapeutic Uses : *Bark* : astringent, febrifuge, anthelmintic, antidotal to snake bite; beneficial in liver troubles and as a collyrium in opthalmia; *leaves*; laxative, diuretic, anthelmintic, galactagogue and emmenagogue; applied externally in buboes and for relieving pain in joints.

Chemical Constituents : Chemical investigation of seeds, flowers, leaves and bark of the plant yields erythraline, erythrinine, erysovine, erysodine, erysonine, erysotrine, 11-hydroxy erysotrine, erysopine, erysotine, erysopitine, erysodienone, stachyadine, N-nororientaline, erybidine, ferulic and caffeic acids, hypaphorine and its methyl ester, N,N-dimethyl tryptophan methyl ester,

scoulerine, (+) coreximine, *l*-reticuline, erybidine, erythrins A, B and C, alpinum, isoflavone, oxyresveratol, dihydroxyresveratol, erythrantine, rutin, quercetin, isorhamnetin-3-O-rhamnoglucoside, quercetin-4-O-glucosyl-3-O-rhamnoglucoside, wighteone, osajin, docosyl alcohol, stigmasterol, sitosterol, choline and fatty acids (*J. sci. industr. Res.*, 1959, **18B**, 494; *Phytochemistry*, 1970, **9**, 2397; *Planta med.*, 1970, **19**, 72; *ibid.*, 1971, **19**, 71; *J. Pharm. Sci.*, 1972, ***61***, *1274*; *Yakugaku Zasshi*, 1973, **93**, 1671; *Lloydia*, 1975, **38**, 97; *ibid.*, 1977, **40**, 471; *ibid.*, 1978, **41**, 342; *Indian J. Chem.*, 1977, **15B**, 201, 205; *Allertonia*, 1982, **3**, 47; *Chem. Abstr.*, 1983, **98**, 14354; *Egypt J. pharm. Sci.*, 1983, **24**, 125).

165. *Glycine max* (L.) Merr. syn. *G. soja* sensu Baker; *Phaseolus max* L.; *Dolichos soja* L.

Vernacular Names: Hind : *Bhat*; Beng : *Garikalai*; Eng : Soyabean.

Occurrence & Distribution : Cultivated as a pulse-crop mainly in Kashmir, Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Maharashtra, Gujarat, Manipur and Naga hills.

Description : An annual herb, with climbing or erect stem, attaining a height of 0.46-1.8 m and densely covered with hairs. Leaves trifoliolate, ovate-lanceolate, long-petioled, 5.1-10.2 cm long. Flowers small, borne in short axillary racemes, white, purple or reddish-purple. Pods sub-torulose, densely hairy, borne in clusters of 3-5, 3.8-5.1 cm long. Seeds 2-4, compressed, elliptical with a long hilum, black, chocolate or yellow.

Flowers in November and fruits in December.

Parts Used : Whole plant and seeds.

Therapeutic Uses : Soyamilk is of particular value in case of milk-allergy and in special diet.

Soybean oil and soyabean meal are prescribed in cases of hypoproteinemia and malnutrition.

Chemical Constituents : Kaempferol and quercetin-3-triglycosides have been isolated from the leaves. Mature beans contain vitamin B-complex, vitamins C,D,E and K. It is also a source of β-amylase, urease, lipoxidase and isoenzymes. Occurrence of various pigments — carotenoids, anthocyanins, biochanins A, B and C, soyasaponins I, II and III, 6-methyl formononetin, 6-methyl daidzein, daidzein-7-glucoside, glucoside of genistein, tatoin, methyl genistein and isogenistein and their glucosides and two galactomannans has been reported (*Sci. & Cult.*, 1945, **11**, 437; *J. sci. industr. Res.*, 1949, **8B**, 217; *Curr. Sci.*, 1953, **22**, 363; *J. chem. Soc.*, 1964, 5058; *J. agric. Fd. Chem.*, 1974, **22**, 806; *Can. J. Bot.*, 1975, **53**, 219; *Phytochemistry*, 1975, **14**, 1389; *Chem. Pharm.*

Bull., 1976, **24**, 121; *J. chem. Soc. chem. Commun.*, 1976, 497; *Tetrahedron Lett.*, 1978, 3127; *Agric. biol. Chem.*, 1979, **43**, 1415).

166. *Glycyrrhiza glabra* L.

Vernacular Names : Sans : *Yashti-madhu*; Hind : *Jethi- madh*; Beng : *Jashtimadhu*; Eng : Licorice.

मधुरं यष्टिमधुकं किञ्चित्तिक्तं च शीतलम् ।
चक्षुष्यं पित्तहृद् रुच्यं शोषतृष्णाव्रणापहम् ।।
(राजनिघण्टु)

madhuraṃ yaṣṭimadhukaṃ kiñcittiktaṃ ca śītalam .
cakṣuṣyaṃ pittahṛd rucyaṃ śōṣatṛṣṇāvraṇāpaham ..
(rājanighaṇṭu)

It is *madhura*, slightly *tikta* (not much bitter), *sheetala* (*sheetaveerya*); used in opthalmia, deranged *pitta*, anorexia, emaciation; allays thirst and cures ulcer.

Occurrence & Distribution : Cultivated in Jammu and Kashmir, Punjab and sub-Himalayan tracts.

Description : A hardy herb or undershrub, attaining a height of 1.8 m. Roots thick, having many branches with red or lemon-colour outside and yellowish or pale-yellow inside. Leaves imparipinnate; leaflets in 4-7 pairs, ovate-lanceolate, smooth. Flowers borne in axillary spikes, papilionaceous, lavender to violet in colour. Pods compressed. Seeds 2-5, reniform, flat, deep grey.

Flowers in March and fruits in August.

Chemical Constituents : Glycyrrhizin isolated from the root is the principal sweetening constituent. Glycyrrhizic and glycyrrhetinic acids, liquiritin, isoliquiritin, neoisoliquiritin, liquiritigenin, isoliquiritigenin, rhamnoliquiritin, glabrine, glabranine, formononetin, licuraside, licochalcones A and B, hispaglabridin A and B, licoricidin, glabrene, pinocembrin, prunetin, saponaretin (isovitexin), 11-deoxoglycyrrhetic, liquiritic and 18α-hydroxyglycyrrhetic acids, 24-hydroxy-11-deoxyglycyrrhetic and 24-hydroxyglycyrrhetic acids (isolated as methylesters), 24-hydroxyliquiritic and liquiridiolic acids, olean-12-en-3β-ol-3O-oic and olean-11,13(18)-dien-3β-ol-3O-oic acids, methyl olean-11, 13(18)-diene-3, 24-diol-3O-oate, glycyrrhetol,21α-hydroxy-isoglabrolide, glabrolide, deoxoglabrolide, isoglabrolide, licoflavonol, kumatakenin, glycyrol, licoricone, glabridin, glabrol, 7-acetoxy-2-methylisoflavone, 7-methoxy-2-methylisoflavone, 7-hydroxy-2-methylisoflavone, glyzarin, glyzaglabrin, licoisoflavones A, B and licoisoflavone, glycyrin, sugars and aspargin are also reported from the plant (*Glossary of Indian Medicinal Plants*, ed. R.N. Chopra *et al*, 1956, 126; *ibid.*, (suppl.), 1969, 32, CSIR, New Delhi; *Dokl. Acad. Nauk. SSSR*, 1964, **155**, 600; *ibid.*, 1966, **169**, 347; *Chem. Abstr.*, 1964, **60**, 14579; *ibid.*, 1966, **65**, 13811; *Tetrahedron*, 1965, **21**, 2109; *Gaz. Chim. Ital.*, 1966, **96**, 833; *ibid.*, 1967, **97**, 769, 1347, 1359; *ibid.*, 1968, **98**, 712; *Chem. Abstr.*, 1966, **65**, 15435; *ibid.*, 1968, **68**, 13206, 49810, 49811, 59439; *Khim. Prir. Soedin.*, 1967, **3**, 56; *ibid.*, 1972, **8**, 805; *ibid.*, 1974, **10**, 93; *ibid.*, 1975, 101; *Chem. Abstr.*, 1967, **67**, 112930; *ibid.*, 1973, **78**, 94806; *ibid.*, 1974, **81**, 60809; *ibid.*, 1975, **83**, 75367; *Corsi. Semin. Chim.*, 1968, **11**, 20; *Chem. Abstr.*, 1970, **72**, 21799; *Pharm. Tijdschr. Belg.*, 1968, **45**, 137; *Chem. Abstr.*, 1969, **70**, 106822; *Indian J. Chem.*, 1972, **10**, 128; *Tetrahedron Lett.*, 1975, 4461; *Phytochemistry*, 1976, **15**, 352; *ibid.*, 1977, **16**, 402, 1279; *Chem. Pharm. Bull.*, 1976, **24**, 752, 991, 1242; *ibid.*, 1978, **26**, 135, 141, 144; *Curr. Sci.*, 1977, **46**, 753; *J. nat. Prod.*, 1980, **43**, 259).

167. *Indigofera linifolia* Retz.

Vernacular Names : Hind : *Torki*; Beng : *Bhangra*.

Occurrence & Distribution : Throughout the plains of India.

Description : A slender procumbent or trailing herb, covered by silvery pubescence. Leaves simple, linear. Flowers brilliant red, borne in 1-8 flowered subsessile short racemes. Pods globose, minute, 1-seeded.

Flowers and fruits almost throughout the year.

Part Used : Whole plant.

Therapeutic Uses : *Whole plant* : in febrile eruption and amenorrhoea.

Chemical Constituents : The plant contains a lactone, linifolin in addition to palmitic, oleic, linoleic, linolenic acids and β-sitosterol (*Proc. nat. Acad. Sci. India*, 1938, 49; *Acta ciene India* (*Ser*) *Chem.*, 1979, **5**, 55; *Chem. Abstr.*, 1979, **91**, 171659; *Oils Oilseeds J.*, 1979, **31**, 21; *Chem. Abstr.*, 1980, **92**, 90904).

168. *Indigofera tinctoria* L.

Vernacular Names: Sans : *Nilini*; Hind & Beng : *Neel*; Tam : *Nili*; Eng : Indian indigo.

नीलिनी रेचनी तिक्ता केश्या मोहभ्रमापहा ।
उष्णा हन्त्युदरप्लीहवातरक्तकफानिलान् ।।
आमवातमुदावर्त्तं मदञ्च विषमुद्धतम् ।।

(भावप्रकाश)

nīlinī rēcanī tiktā kēśyā mōhabhramāpahā .
uṣṇā hantyudaraplīhavātaraktakaphānilān ..
āmavātamudāvarttaṃ madañca viṣamuddhatam ..

(bhāvaprakāśa)

It is laxative, *tikta*, *ushna*; hair tonic; beneficial in stupor, vertigo, ascites, spleenomegaly, gout, deranged *kapha*, *anila* (*vata*), rheumatoid arthritis, constipation, syncope and powerful antidotal.

Occurrence & Distribution : Throughout India.

Description: A shrub, 61.0-182.9 cm high. Bark white. Leaves 2.5- 7.6 cm long, slightly black upon drying; leaflets 9-13. Flowers small, reddish-yellow. Pods straight or slightly curved, glabrescent.

Flowers during rainy season and fruits during winter.

Parts Used : Whole plant, leaves and root.

Therapeutic Uses : *Whole plant* : ointment from the extract (also crushed leaves) in the form of poultice applied to sores, ulcers and piles; *leaves* : juice prescribed in asthma, whooping cough, palpitation of heart, bronchitis and in kidney troubles; *root* : decoction useful in urinary troubles and hepatitis.

Chemical Constituents : The plant contains the glycoside indican which on acid hydrolysis and aerial oxidation yields indigo. A water soluble galactomannan has also been isolated from the seeds (*Glossary of Indian Medicinal Plants*, ed. R.N. Chopra *et al*, 1956, 141, CSIR, New Delhi; *Wlth India*, 1959, **5**, 182, CSIR, New Delhi; *Carbohydrate Res.*, 1986, **157**, 251).

169. *Lathyrus sativus* L.

Vernacular Names : Sans : *Triputi*; Hind & Beng : *Khesari*; Eng : Grass pea.

त्रिपुटो मधुरस्तिक्तस्तुवरो रुक्षणो भृशम् ।
कफपित्तहरो रुच्यो ग्राहकः शीतलस्तथा ।।
किन्तु खञ्जत्वपंगुत्वकारी वातातिकोपनः ।।

(भावप्रकाश)

tripuṭō madhurastiktastuvarō rukṣaṇō bhṛśam .
kaphapittaharō rucyō grāhaka: śītalastathā ..
kintu khañjatvapaṅgutvakārī vātātikōpana: ..
(bhāvaprakāśa)

It is *madhura*, *tikta*, *tuvara* (*kashaya*), *ruksha*; subdues deranged *kapha* and *pitta*; appetizing, astringent, *sheetala* (*sheetaveerya*); it causes lathyrism and vigorously aggravates *vata*.

Occurrence & Distribution : Cultivated throughout India for pulse-crop.

Description : A much branched sub-erect annual herb. Stems up to 1.2 m long. Leaves pinnately compound; leaflets generally 2, linear-lanceolate, upper leaflets modified into tendrils. Flowers axillary, solitary, blue, purple or white. Pods flat, oblong, dorsally 2-winged, slightly curved, 2.5-3.7 cm long. Seeds 4-5, usually spotted or mottled, greyish brown or yellowish.

Flowers during December-January and fruits during February-March.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : nutritive but toxic on prolonged consumption resulting in paralysis of legs both in animals and human beings known as lathyrism*.

Chemical Constituents : Seeds contain putrescine, cadaverine, agmatine, spermidine, spermine, homoagmatine, β-aminopropionitrile, cyanin, pelargonin, glucose, mannose, fructose, citric, tartaric and malic acids, poly-β-hydroxybutyric acid, lathycarpin, O-acetylethanolamine, cystine, L-homoarginine, β-alanine, phenylalanine, glycine, serine, leucine, isoleucine, aspartic and glutamic acids, methionine, proline, tryptophan, a toxic compound (β-N-oxalyl-α, β-diaminopropionic acid) and aflatoxin [*Flora (Jena)*, 1962, **152**, 236; *Chem. Abstr.*, 1964, **60**, 852; *Indian J. med. Res.*, 1963, **51**, 468; *Biochemistry*, 1963, **2**, 298; *Curr. Sci.*, 1963, **32**, 153; *Phytochemistry*, 1964, **3**, 73; *Indian J. Biochem. Biophys.*, 1974, **11**, 128; *J. sci. Res.*, 1976, **26**, 91; *Chem. Abstr.*, 1978, **89**, 106106; *Curr. Sci.*, 1977, **46**, 62; *Indian Phytopathol.*, 1978, **31**, 473; *J. agric. Fd. Chem.*, 1982, **30**, 620; *Chem. Abstr.*, 1982, **96**, 198107; *Biochem. Biophys. Acta*, 1982, **704**, 26; *Z. Naturforsch.*, 1982, **37C**, 724; *Chem. Abstr.*, 1982, **97**, 741855; *Phytochemistry*, 1987, **26**, 839].

* The toxic substance responsible for lathyrism has been identified as selenium (*Nature*, 1952, **170**, 124).

170. *Lens culinaris* Medic.
syn. *L. esculenta* Moench; *Ervum lens* L.

Vernacular Names: Sans, Hind & Beng : *Masura*; Tam : *Misurpurpu*; Eng : *Lentil*.

मसुरो मधुरः शीतः संग्राही कफपित्तजित् ।
वातामयकरश्चैव मूत्रकृच्छ्रहरो लघुः ।।
(राजनिघण्टु)

masurō madhuraḥ śītaḥ saṅgrāhī kaphapittajit
vātāmayakaraścaiva mūtrakṛcchharō laghuḥ ..
(rājanighaṇṭu)

Lentil is *madhura*, *sheeta* (*sheetaveerya*), astringent; subdues deranged *kapha* and *pitta*; aggravates *vata*; cures dysuria; *laghu*.

Occurrence & Distribution : It is a cold weather crop, cultivated throughout India.

Description: A small erect pubescent herb, 15-75 cm in height. Leaves compound; leaflets narrow, in 4-6 pairs; rachis as long as peduncle. Flowers red, rose, violet or white, borne singly or in 2-4 on a slender axillary peduncle. Pods smooth, oblong or rhomboidal, compressed, 1.0-1.5 cm long. Seeds 2, smooth, lenticular, compressed, pale-pinkish buff to prussian red.

Flowers during December-January and fruits during March-April.

Part Used : Seeds.

Therapeutic Uses: *Seeds* : mucilaginous, laxative, useful in constipation and various intestinal affections; paste or poultice applied to foul and indolent ulcers; soup nutritive, astringent and used in gastric troubles.

Chemical Constituents : Indolyl acrylic acid, lenticin, tricetin, luteolin, diglycosyldelphinidin, proanthocyanidins, kaempferol glycoside, 5-deoxy-kaempferol, *trans*-ferulic acid. *trans-p*-coumaric acid, syringic acid, aflatoxin, 4′,7-dihydroxy-, 3′,4′,7′-trihydroxy-, 4′,7-dihydroxy-3′-methoxy-flavones and variabilin have been isolated (*Phytochemistry*, 1973, **14**, 475; *ibid.*, 1978, **17**, 807, 826; *J. agric. Fd. Chem.*, 1984, **32**, 131; *Nuori. Ann. Ig. Microbial* 1984, **35**, 51; *Chem. Abstr.*, 1986, **105**, 151678; *Plant Soil*, 1986, **92**, 113; *Chem. Abstr.*, 1986, **104**, 165685).

171. *Melilotus indica* (L.) All.
syn. *M. parviflora* Desf.; *Trifolium indica* L.

Vernacular Names : Sans : *Banamethika*; Hind & Beng : *Banmethi*; Eng : Sweet clover.

Occurrence & Distribution : Sweet clover is grown widely in tropical zones of India.

Description : An erect, annual herb, up to 0.5 m in height. Leaves trifoliolate; leaflets emarginate or retuse, oblanceolate or obovate. Flowers borne in slender racemes, yellow, 6-12 per peduncle. Pods ellipsoid, compressed, olive-green when ripe. Seeds 6-10, oblong-ellipsoid, compressed, brown.

Flowers and fruits during January-February.

Parts Used : Whole plant and seeds.

Therapeutic Uses : *Whole plant* : emollient and applied externally as a fomentation and as plaster for swelling; *seeds* : in bowel complaints and infantile diarrhoea.

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Chemical Constituents : Glucose, fructose, sorbose, raffinose, cellobiose, coumarin and β-sitosterol have been reported from the plant (*Pakist. J. sci. industr. Res.*, 1966, 9, 173; *Chem. Abstr.*, 1967, **66**, 17062).

172. *Mucuna pruriens* (L.) DC.
syn. *M. prurita* Hook.

Vernacular Names : Sans : *Kapikacchu*; Hind : *Kiwach*; Beng : *Alkushi*; Tam : *Poonaikkalei*; Eng : Cowhage.

कपिकच्छुः स्वादुरसा वृष्या वातक्षयापहा ।
शीतपित्तास्रहन्त्री च विकृता व्रणनाशिनी ।।
(राजनिघण्टु)

kapikacchu: svādurasā vṛṣyā vātakṣayāpahā .
śītapittāsrahantrī ca vikṛtā vraṇanāśinī ..
(rājanighaṇṭu)

The plant is *svadu rasa* (*madhura rasa*); promotes virility; beneficial in deranged *vata* and in emaciation, urticaria, dyscrasia and septic wounds.

Occurrence & Distribution : Almost throughout India and in Andaman and Nicobar Islands.

Description : A herbaceous twinning annual. Leaves trifoliolate, grey silky below; leaflets elliptic, broadly ovate or rhomboid ovate, unequal at the base. Flowers borne in axillary, pendulous racemes, purple. Pods curved, turgid, longitudinally ribbed, 5-10 cm, 1.5-1.8 cm, densely clothed with grey or pale-brown bristles (which causes intense itching and dermatitis). Seeds 4-6, ovoid.

Flowers and fruits almost throughout the year.

Parts Used : Pods, seeds and root.

Therapeutic Uses : *Pods*: anthelmintic; *seeds* : aphrodisiac and nerve tonic. *Vanari vatika*, a pill prepared from the powdered decorticated seeds after being boiled in cow's milk, then fried in butter fat and mixed with sugar and subsequently steeped in honey is considered to be the best aphrodisiac in Ayurveda (Nadkarni); the pills also find application in leucorrhoea, menorrhagia and in paralysis; *root* : nerve tonic and diuretic; decoction beneficial in urinary troubles and delirium in fevers; strong infusion mixed with honey efficacious in cholera; powder made into a paste applied to the body in dropsy; an ointment from the roots used in elephantiasis.

Chemical Constituents : Seeds yield 3,4-dihydroxy-phenylalanine (L-dopa), mucunine, mucunadine, prurienine, prurieninine, tryptamine and 5-hydroxytryptamine. Seed oil contains stearic, palmitic, myristic, arachidic, oleic, linoleic acids and a sterol. Seed meal hydrolysate gives tryptophan, cystine, and methionine. The trichomes of the pods contain only 5-hydroxytryptamine whereas the leaves show the presence of 6- methoxyharman. N,N-dimethyltryptamine, its N_b-oxide, bufotenine, 5-methoxy-N,N-dimethyl-tryptamine, 5-oxy-indole-3- alkylamines, a β-carboline, L-tyrosine, formyl tyrosine, formyl-3,4-dihydroxyphenylalanine, C_{18}- unsaturated acid and *cis*-12, 13-epoxyoctadec- *trans*-9-enoic acid and *cis*-12, 13-epoxyoctadec- *cis*-9-enoic (vernolic) acids are reported from different parts of the plant. Choline has been obtained from all parts of the plant (*Planta med.*, 1985, **166**, 421; *Fette Seifen Anstrichm.*, 1986, **88**, 144; *Chem. Abstr.*, 1986, **105**, 5369; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, **2**, 283, ICMR, New Delhi).

173. *Ougeinia oojeinensis* (Roxb.) Hochr.
syn. *O. dalbergioides* Benth.

Vernacular Names : Sans : *Tinisha**; Hind : *Tinsa*; Beng : *Tinis*; Tam : *Narivengai;* Eng : Sandan.

तिनिशः श्लेष्मपित्तास्रमेदः कुष्ठप्रमेहजित् ।
तुवरः श्वित्रदाहघ्नो व्रणकण्डूक्रिमिप्रणुत् ॥
(द्रव्यगुण)

tiniśa: ślēṣmapittāsramēda: kuṣṭhapramēhajit .
tuvara: śvitradāhaghnō vraṇakaṇḍūkrimipraṇut ..
(dravyaguṇa)

It pacifies deranged *sleshma* and *pitta*; is beneficial in dyscrasia, obesity, skin diseases and polyuria; *tuvara* (*kashaya*); useful in the treatment of leucoderma, burning sensation, ulcer, pruritus and worms.

Occurrence & Distribution : The hilly tracts of tropical India; also planted ornamentally.

* *Lagerstroemia speciosa* (Vol. III in the series) is also known as *Tinisha* in Sanskrit.

172. *Mucuna pruriens* (L.) DC.

174. *Pisum sativum* L.

177. *Psoralea corylifolia* L.

184. *Teramnus labialis* Spreng.

180a. *Sesbania grandiflora* Pers. (tree)

180b. *Sesbania grandiflora* Pers. (flowering branch)

185. *Trigonella foenum-graecum* L.

188. *Vigna mungo* (L.) Hepper

Description : A small to medium-sized deciduous tree, about 12 m in height and 1.35 m in girth, with fairly straight to crooked trunk. Bark deeply cracked, brown or grey. Sapwood grey but heartwood golden-brown when freshly exposed and ageing to reddish-brown with darker streaks. Leaves pinnately trifoliolate; leaflets coriaceous. Flowers borne in short fascicled racemes, fragrant, pink or white. Pods flat, light-brown, 5.1-7.6 cm long. Seeds 2-5, flat.

Flowers in March and fruits in April.

Part Used : Bark.

Therapeutic uses : *Bark* : febrifuge; decoction prescribed when the urine is highly coloured; a *kino*-like exudation form the incised bark useful in diarrhoea and dysentery.

Chemical Constituents : Genistein, ferreirin, neophellamuretin, orobol, wedelolactone, homoferririn, ougenin (5,2′,4′-trihydroxy-7-methoxy-6-methyl-isoflavanone), 5,7,2′,4′,-tetrahydroxy-isoflavanone, betulin, dalbergioidin and kaempferol have been reported from the plant (*Proc. Royal Soc. London*, 1962, **268A**, 1; *Chem. Abstr.*, 1962, **57**, 7628 ; *Trans. Bose Res. Inst.*, 1963, **36**, 55; *Chem. Abstr.*, 1966, **64**, 8645; *Indian J. Chem.*, 1966, **4**, 250; *J. Indian chem. Soc.*, 1984, **61**, 561).

174. *Pisum sativum* L. syn. *P. arvense* L.

Vernacular Names : Sans, Hind & Beng : *Matar*; Tam : *Pattani*; Eng : Pea.

कलायः कुरुते वातं पित्तदाहकफापहः ।
रुचिपुष्टिप्रदः शीतः कषायश्चामदोषकृत् ॥
(राजनिघण्टु)

kalāya: kurutē vātaṃ pittadāhakaphāpaha: .
rucipuṣṭiprada: śīta: kaṣāyaścāmadōṣakṛt ..
(rājanighaṇṭu)

It causes *vata* subdues deranged *pitta* and *kapha*; alleviates burning sensation; appetizing, nutritious, *sheeta* (*sheetaveerya*), *kashaya*; causes *amadosha*.

Occurrence & Distribution : Cultivated throughout the tropical regions in India.

Description : An annual herb, with hollow stems ending in one or more tendrils. Leaves pinnately compound with auricled stipules. Flowers bluish,

purple or white. Pods curved or straight, blunt or pointed, 5-10 cm long with a thin or thick wall. Seeds 6-9, smooth and rounded or flattened or wrinkled, green, yellow-green, white-grey, brown or mottled.

Flowers in September-October and fruits during November- December.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : flour considered to be emollient when applied in the form of cataplasm; crude extract affects the ciliar movements and suppresses cough reflex. Clinical trial with *m*-xylohydroquinone, the active principle of the pea oil, was reported to reduce pregnancy rate in female and spermatozoa in male by 50-60% without any toxic manifestation.

Chemical Constituents : Seeds have high content of proteins (28%), vitamins, amino acids and minerals. Chemical investigation on the stems, shoots and seeds has revealed the presence of β-amyrin, β-sitosterol, trigonelline, quercetin, piplartine, *m*-xylohydroquinone, galactolipids, anthocyanins, carotenes, isoflavonoids, glycosyltranferase, isoenzymes 4-coumarate-CoA ligases. Pisatin characterised as 3-hydroxypterocarpin, kaempferol-3-triglucoside, quercetin-3-triglucoside and their *p*-coumaric acid esters, L-pipecolic acid, methyl-4-chloroindole-3-acetate and and a glycoside, pisatoside have also been reported (*J. Amer. Chem. Soc.*, 1962, **84**, 1919; *Phytochemistry*, 1965, **4**, 285; *Meiji Daigaku Nogakubu Kenkya Hokoku*, 1966, 79; *Chem. Abstr.*, 1967, **66**, 83079; *Arch. Biochem. Biophys.*, 1967, **121**, 531; *Chem. Abstr.*, 1968, **68**, 59838 : *Wlth India*, 1969, **8**, 134, CSIR New Delhi; *Chem. Pharm. Bull.*, 1970, **18**, 1872; *J. chem. Soc. Perkin I*, 1975, 946; *Canad. J. Bot.*, 1978, **56**, 2890; *Phytochemistry*, 1977, **16**, 1891; *ibid.*, 1980, **19**, 1355; *Z. Naturforsch.*, 1979, **34C**, 87, 290).

175. *Pongamia pinnata* Pierre syn. *P. glabra* Vent.

Vernacular Names : Sans, Hind & Beng : *Karanja*; Tam : *Pongam*; Eng : Indian beech.

करञ्जः कटुरुष्णश्च चक्षुष्यो वातनाशनः ।
तस्य स्नेहोतिस्निग्धश्च वातघ्नः स्थिरदीप्तिदः ॥
(राजनिघण्टु)

karañjaḥ kaṭuruṣṇaśca cakṣuṣyō vātanāśanaḥ .
tasya snēhōtisnigdhaśca vātaghnaḥ sthiradīptidaḥ ..
(rājanighaṇṭu)

It is *katu*, *ushna*; used in opthalmia; subdues deranged *vata*; oil is very smoothing and beneficial in gout; induces lashing radiance

Occurrence & Distribution : Throughout India up to an altitude of 1,200 m and in the Andamans.

Description : A medium-sized glabrous tree, with a short bole and spreading crown, up to 18 m in height and 1.5 m in girth. Leaves imparipinnate; leaflets 5-7, elliptic or ovate, 5.1-17.8 cm long. Flowers borne in axillary racemes, fragrant, lilac or white, tinged with pink or violet; peduncle as long as the rachis. Pods compressed, woody, glabrous, indehiscent, elliptic to obliquely oblong, 4.0-7.5 cm long and 1.7-3.2 cm broad. Seeds 1-2, elliptic or reniform, wrinkled, 1.7-2.0 cm long and 1.2-1.8 cm broad with reddish-brown leathery testa.

Flowers and fruits during May-June.

Parts Used : Flowers, seeds, leaves, bark and root.

Therapeutic Uses : *Flowers* : remedy for diabetes; *seeds* : powder efficacious in whooping and irritating coughs in children; oil prescribed internally in stomachic and dyspepsia with sluggish fever; applied externally either alone, or in combination for skin diseases, in sores, scabies, herpes and eczema; *leaves* : juice effective in cough, flatulency, dyspepsia and diarrhoea; paste applied internally to ulcers infested with worms; *bark* : used externally in bleeding piles; decoction given in beri-beri; *root* : juice useful for external application to destroy

maggots in foul ulcers and fistulous sores, cleaning teeth and strengthening gums.

Chemical Constituents : A number of compounds have been obtained from the seeds, seed oil, flowers, leaves, stem-bark, heartwood and root, some of which have commercial applications; karanjin, pongapin, 3-methoxypongapin, pongaglabrone, kanjone, pongol, gamatin, lanceolatin 3, pinnatin, 5-methoxy-3′, 4′-methylenedioxyfurano-(8,7-4″,5″)-flavone, 5′-methoxy-3′,4′-methylenedioxy-furano-(2″,3″-7,8)-flavone, 5-methoxyfurano (2″,3″,7,8)-flavone, 5-methoxy-3′, 4′-methylenedioxyfurano-(2″,3″,7,8)-flavone, lonchocarpin, isolonchocarpin, (−)-isolonchocarpene, karanjachromene, pongachromene, isopongachromene, pongaflavone, isopongaflavone, ovalichromene B, pongamol, ovalitenone, glabrin, kanugin, cemethoxykanugin, fisetin tetramethylether, glabrachalcone, glabrachromene I, glabrachromene II, pongachalcone I, pongachalcone II, pongaglabol, isopongaglabol, 6-methoxyisopongaglabol, β-sitosterol, kaempferol and its glycoside, quercetin glycoside, pongamin, sterolin, neoglabrin, glabrasaponin, cycloart-23-ene-3β, 25-diol, friedelin and a dipeptide aurantiamide acetate. Fatty acid composition of the seed oil has also been reported (*Wlth India*, 1969, **9**, 208; *J. Indian chem. Soc.*, 1983, **30**, 781; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, 2, 491, ICMR, New Delhi).

176. *Prosopis cineraria* (L.) Druce
syn. *P. spicigera* (L.); *Mimosa cineraria* L.

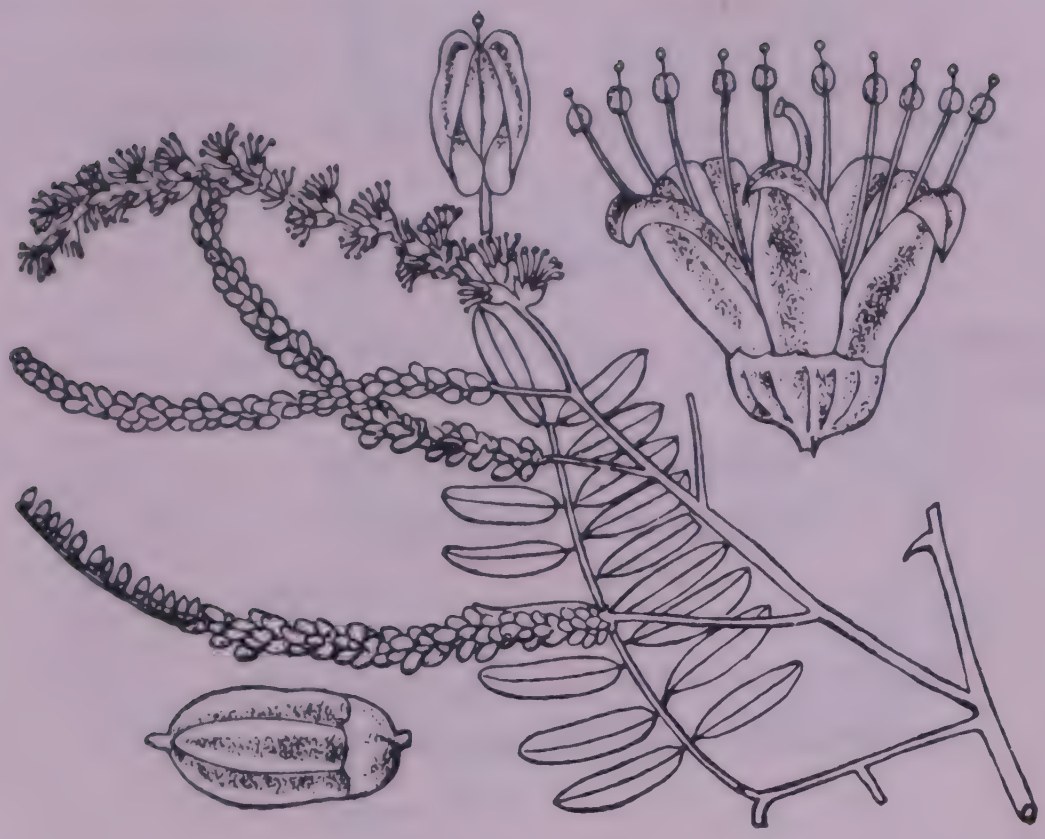
Vernacular Names : Sans & Beng : *Shami*; Hind : *Jand*; Tam : *Perumbay*; Eng : Algarobo.

शमी तिक्ता कटुः शीता कषाया रेचनी लघुः ।
कफकासभ्रमश्वासकुष्ठार्शः क्रिमिजित् स्मृतः ॥
(द्रव्यगुण)

śamī tiktā kaṭuḥ śītā kaṣāyā rēcanī laghuḥ .
kaphakāsabhramaśvāsakuṣṭhārśaḥ krimijit smṛtaḥ ..
(dravyaguṇa)

It is *tikta*, *katu*, *sheeta* (*sheetaveerya*), *kashaya*, *laghu* and purgative; beneficial in deranged *kapha*, cough, vertigo, dyspnea, skin diseases, piles and worms.

Occurrence & Distribution : Dry and arid regions of India; cultivated as a hedge plant.



Description : A small to moderate-sized tree, evergreen, with light foliage and slender branches having conical spines. Bark rough, exfoliating in thin flakes. Leaves bipinnate, generally with 2 pairs of pinnae; pinnules 7-12 pairs. Flowers borne in slender spikes, small, yellowish. Pods cylindric, torulose or flattish with coriaceous exocarp. Seed 10-15, compressed, oblong, with moderately hard brown testa.

Flowers and fruits during April-July.

Parts Used : Flowers, pod, bark and root.

Therapeutic Uses : *Flowers* : powder mixed with sugar is given to pregnant women as a safeguard against miscarriage; *pod* ; astringent, demulcent and pectoral; *bark* : efficacious in rheumatism; *root* : anti-dysenteric.

Chemical Constituents : The plant affords patulitrin, prosogerin A (6-methoxy-7-hydroxy-3′, 4′-methylenedioxyflavone), prosogerin B (2′, 4′-dihydroxy-5′-methoxy-3,4-methylenedioxy-chalcone), prosogerins C and D, lipid, β-sitosterol, proteins consisting of prolamines, albumins, globulins and glutelins, an alkaloid—spicigerine, characterised as 3-hydroxy-2-methyl-6-piperidyl alkanoic acid, sugars, amino acids and vitamins (*Indian J. Chem.*, 1964, **2**, 83; *ibid.*, 1978, **16B**, 1133; *Pahlavi Med. J.*, 1974, **5**, 1; *Chem. Abstr.*,

1974, **81**, 23097; *Phytochemistry*, 1979, **18**, 355; *Indian J. Chem.*, 1979, **17B**, 290; *Curr. Sci.*, 1979, **48**, 381; *Phytochemistry*, 1980, **19**, 1269; *Indian Forest.*, 1982, **108**, 669; *Indian J. exp. Biol.*, 1984, **22**, 592; *J. Pharm. Karachi*, 1986, **5**, 25; *Chem. Abstr.*, 1988, **108**, 36459; *Trans. Indian Soc. desert Technol.*, 1987, **12**, 149; *Chem. Abstr.*, 1988, **109**, 167348).

177. *Psoralea corylifolia* L.

Vernacular Names : Sans : *Vakuchibheda*; Hind & Beng : *Babchi*, Tam : *Kaarboka arisi*; Eng : Babchi.

श्वित्रारिर्वाकुचीभेदः कुष्ठदोषत्रयास्रजित् ।
वातरक्तहरो लेपात् सिध्मश्वित्रविनाशनः ।।
(द्रव्यगुण)

śvitrārirvākucībhēdaḥ kuṣṭhadōṣatrayāsrajit .
vātaraktaharō lēpāt sidhmaśvitravināśanaḥ ..
(dravyaguṇa)

Vakuchibheda (*Switrari*) is beneficial in skin diseases, deranged *tridosha*, dyscrasia, gout; externally used to cure nettle rash and leucoderma.

Occurrence & Distribution : Found on roadsides and waste places in many parts of India.

Description : An erect annual, 30-180 cm in height. Leaves broadly elliptic, inciso-dentate. Flowers borne in axillary long- peduncled heads, bluish-purple or yellow. Pods indehiscent, ovate, mucronate, somewhat compressed, dark chocolate to almost black, 3.5-4.5 mm × 2.0-3.0 mm. Seed 1, smooth, adhering to the pericarp.

Flowers and fruits during April-June.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : paste or ointment specially used for leucoderma of non-syphilitic origin, psoriasis and inflammatory diseases of skin; *powder*: laxative, anthelmintic, diuretic and diaphoretic.

Chemical Constituents : Seeds yield raffinose, psoralen, isopsoralen (angelicin), corylifolean, corylifolin, corylifolinin, psoralidin, isopsoralidin, bakuchiol, bavachin, isobavachin, 7-O-methylbavachin, bavachinin, 4-O-methylbavachalcone, isobavachalcone, neobavaisoflavone, bavachromene, triacontane, β-sitosterol-D-glucoside, corylidin, bavachalcone, isobavachalcone,

neobavachalcone, bakuchalcone, isoneobavachalcone, psoralidin-2,3-oxide diacetate and stigmasterol. Limonene, α-elemene, β-caryophylenoxide, 4-terpineol, linalool, geranylacetate, angelicin, psoralene, and bakuchiol are reported from the seed oil.

Fruit contains corylin, corylinal and neobavaisoflavone including the methyl ethers of the two compounds, psoralenol, 5′-formyl-2′, 4-dihydroxy-4′-methoxychalcone and bavachromanol. Daidzein, trilaurin, coumesterol, sitosterol, psoralen and isopsoralen have been reported from the root (*Yao Hsueh Pao*, 1979, **14**, 605; *Chem. Abstr.*, 1980, **93**, 53852; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, **2**, 519, ICMR, New Delhi).

178. *Pterocarpus marsupium* Roxb.

Vernacular Names: Sans : *Pitasara*; Hind : *Bijasar*; Beng : *Pitashal*; Tam : *Vengai*; Eng : Indian Kino tree.

Occurrence & Distribution : Common in the hilly regions throughout Southern India, extending to Gujarat, Madhya Pradesh, Uttar Pradesh, Bihar and Orissa.

Description : A moderate to large deciduous tree, up to 30 m in height and 2.5 m in girth, with a straight clean bole. Bark rough, scaly and longitudinally fissured. Leaves imparipinnate; leaflets generally 5-7, oblong, veins in 15-20 pairs. Flowers borne in large panicles, fragrant, yellowish. Pods flat, orbicular, winged, up to 5 cm diam. Seeds 1-3, bony, convex, separated by hard dissepiments.

Older trees yield a gum (kino) which exudes when an incision is made through the bark up to the cambium. It occurs in small (3-5 mm), angular, glistening, brittle fragments, appearing almost black in colour.

Flowers during rainy season and fruits during summer.

Parts Used : Leaves, bark and wood.

Therapeutic Uses: *Leaves* : paste applied externally to abscess, sores and other skin diseases; *bark* : astringent; decoction beneficial in diarrhoea; gum (kino) astringent, useful in diarrhoea, pyrosis and toothache; *wood* : cold aqueous extract prescribed in diabetes.

Chemical Constituents : The plant contains protein, pentosan and mucilage. Pterosupin, pseudobaptigenin, liquiritigenin, isoliquiritigenin, garbanzol, 5-deoxykaempferol, *p*-hydroxybenzaldehyde, selin-4(15)-en-1β,11 diol, β-eudesmol, erythrodiol-3-monoacetate, pterostilbene, *l*-epicatechin, marsupol, carpusin, propterol, propterol B, marsupinol, 5,4′-dimethoxy-8-methylisoflavone-

7-O-α-L-rhamnopyranoside, retusin-7-O-β-D-glucopyranoside, irisolidone-7-O-α-L-rhamnopyranoside, 5,7-dihydroxy-6-methoxy-7-O-α-L-rhamnopyranoside, marsupin, (2S)-7-hydroxy-7-hydroxyflavanone, 7,4′- dihydroxyflavone, 3,7,4′-trihydroxyflavone, (2R)- 3-(*p*-hydroxyphenyl)-acetic acid, 4,2′, 4′-trihydroxy-chalcone, oleanolic acid and 7-hydroxy 5,4′-dimethoxy-8-methyliso-flavone-7-rhamnoside have been obtained mainly from the heartwood and root. The gum- kino (from the bark) provides a non-glucosidal tannin, kinotannic acid, kinoin ($C_{28}H_{24}O_{12}$) and kino-red ($C_{28}H_{22}O_{11}$) in addition to small quantities of catechol (pyrocatechin), protocatechuic acid, resin, pectin and gallic acid (*Wlth India*, 1969, **8**, 304, CSIR, New Delhi; *J. Indian chem. Soc.*, 1984, **61**, 728; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, **2**, 531, ICMR, New Delhi).

179. *Pterocarpus santalinus* L.f.

Vernacular Names : Sans, Hind & Beng : *Raktachandana*; Tam : *Sivappu chandanam*; Eng : Red sandalwood.

रक्तचन्दनमतीव शीतलं तिक्तमीक्षणगदास्रदोषनुत् ।
भूतपित्तकफकासससज्ज्वरभ्रान्तिजन्तुवमिजित् तृषापहम् ॥
(राजनिघण्टु)

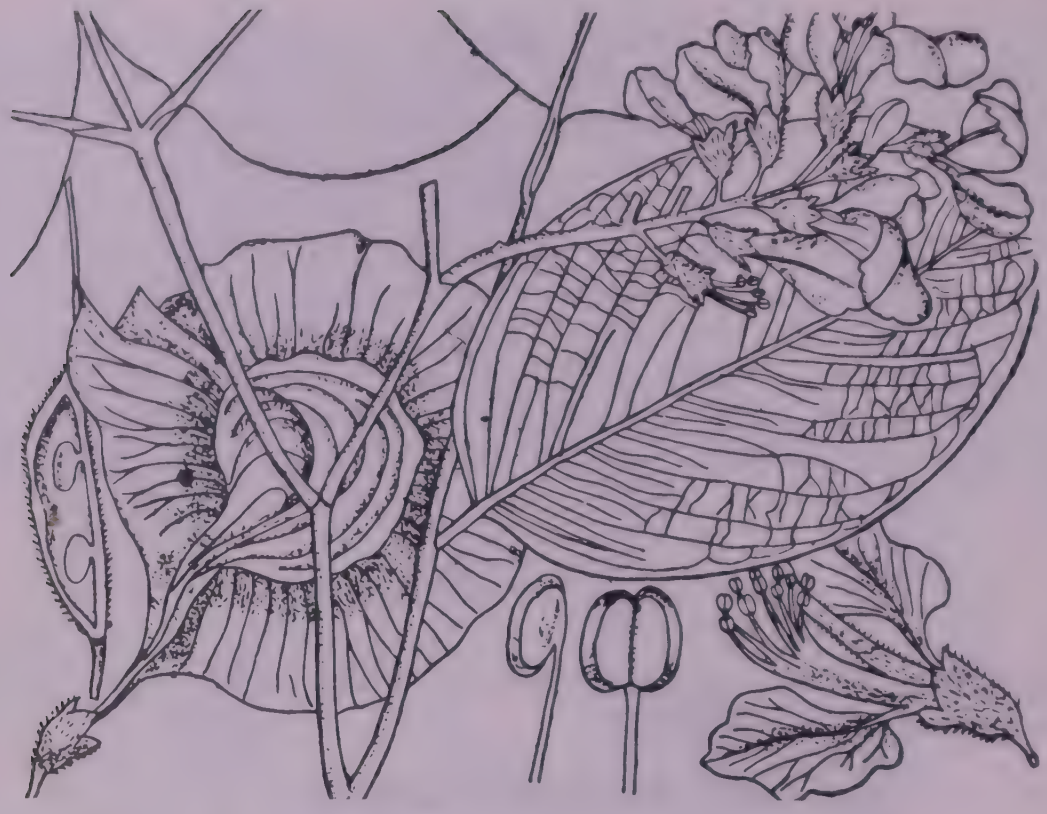
raktacandanamatīva śītalaṃ tiktamīkṣaṇagadāsradōṣanut .
bhūtapittakaphakāsasajjvarabhrāntijantuvamijit tṛṣāpaham .
(rājanighaṇṭu)

It is extremely *sheeta* (*sheetaveerya*), *tikta*; beneficial in opthalmia, dyscrasia, mental diseases, deranged *pitta*, *kapha*, cough, fever, vertigo, worms, vomiting and thirst.

Occurrence & Distribution : Mainly restricted to Andhra Pradesh, particularly Cuddapah district and neighbouring areas of Karnataka and Tamil Nadu.

Description : A small to medium-sized deciduous tree, up to 11 m in height and 1.5 m in girth. Bark deeply cleft into rectangular plates, and exuding a deep red sap when cut, blackish-brown Sapwood white but heartwood claret-purple with streaks or purplish-black or almost black. Leaves generally imparipinnate; leaflets 3 or 5. Flowers borne in simple or sparingly branched racemes, yellow. Pods wooly, central hard and long portion containing the seed. Seeds smooth, coriaceous, reddish-brown.

Flowers and fruits during Summer.



Part Used : Wood.

Therapeutic Uses : *Wood* : tonic, astringent; beneficial in fever, dysentery and haemorrhage; applied externally in the form of paste in headache, inflammations, boils, piles and in opthalmia.

Chemical Constituents : Bark, heartwood and sapwood yield santalin A, santalin B, isopterocarpolone, pterocarptriol, isopterocarpene, pterocarpdiolone, pterocarpol, cryptomeridiol, acetyl oleanolic aldehyde, acetyloleanolic acid, pterostilbene, β-eudesmol, lupeol, lup-(20) 29-en-2α, 3α-diol, betulin, lup-20(29)-en-2α, 3β-diol. The leaves contain β-amyrone, β-amyrin, lupenone, epilupeol, erythrodiol, betulin, leucoanthocyanin and anthocyanidin, sitosterol and stigmasterol. Melilotic acid, esculetin and quercetin-3-rutinoside have also been reported (*Indian J. For.*, 1984, **7**, 19; *Medicinal Plants of India*, ed. G.V. Satyavati, *et al*, 1987, **2**, 532, ICMR, New Delhi).

180. *Sesbania grandiflora* Pers.

Vernacular Names : Sans : *Agasti*; Hind & Beng : *Bak*; Tam : *Agathi*; Eng : Swamp pea.

अगस्तिः पित्तकफजित् चतुर्थकहरो हिमः ।
रुक्षो वातकरस्तिक्तः प्रतिश्यायनिवारणः ।।

(द्रव्यगुण)

agasti: pittakaphajit caturthakaharō hima: .
rukṣō vātakarastikta: pratiśyāyanivāraṇa: ..
(dravyaguṇa)

It is useful in deranged *pitta*, *kapha* and quartan fever; *hima* (*sheetaveerya*), *ruksha*; aggravates *vata*; *tikta*; cures coryza.

Occurrence & Distribution : Cultivated in many parts of India.

Description : A short-lived, quick-growing, soft-wooded tree, 6-9 m in height. Leaves pinnate, 15-30 cm long; leaflets 42-62 oblong, glabrous, 2.5-5.0 cm long. Racemes axillary, short, 2-4 flowerd. Flowers 6.0-10.0 cm long, with showy, fleshy, white, crimson or pink petals. Pods pendulous, rather flat, somewhat 4-cornered, non-torulose, septate with swollen margins and 15-30 pale-coloured seeds.

Flowers throughout the year and fruits during winter.

Parts Used : Flowers, leaves, bark and root.

Therapeutic Uses : *Flowers* and *leaves* : juice beneficial in nasal catarrh and headache; flower-juice improves vision (as eye drops); ideal expectorant; *leaves* in the form of poultice applied to bruises; aperient, tonic and diuretic; *bark* : astringent and tonic, febrifuge; infusion beneficial in small pox; *root* : juice with honey as expectorant.

Chemical Constituents : Grandifloral, arginine, cystine, histidine, isoleucine, phenylalanine, tryptophan, valine, threonine, alanine, asparginc, aspartic acid and a saponin yielding oleanolic acid, galactose, rhamnose and glucuronic acid have been repdorted (*Wlth India*, 1972, **9**, 297, CSIR, New Delhi).

181. *Sesbania sesban* (L.) Merr. syn. *S. aegyptiaca* (Poir.) Pers.; *Aeschynomene sesban* L.

Vernacular Names : Sans, Hind & Beng : *Jayanti*; Tam : *Champai*; Eng : Egyptian rattle pod.

ज्ञेया जयन्ती गलगण्डहारी तिक्ताक्टूष्णानिलनाशिनी च ।
भूतपहा कण्ठविशोधनी च कृष्णा तु सा तत्र रसायणी स्यात् ।।
(राजनिघण्टु)

jñēyā jayantī galagaṇḍahārī tiktākaṭūṣṇānilanāśinī ca .
bhūtapahā kaṇṭhaviśōdhanī ca kṛṣṇā tu sā tatra rasāyaṇī
(rājanighaṇṭu)

Jayanti is used in the treatment of goitre; it is *tikta*, *katu*, *ushna*; subdues deranged *anila* (*vata*); beneficial in mental disease and cures hoarseness. Deep purple flowers act as rejuvenator.

Occurrence & Distribution : Throughout India, up to an altitude of 1,200 m.

Description : A short-lived, quick-growing, soft-wooded tree. 1.8-6.0 m in height. Leaves paripinnate, 7.5-15.0 cm long; leaflets 8-20 pairs, glabrous, entire, acuminate to mucronate, 2.0-3.0 cm long. Racemes 6-12 flowered. Petals yellow, purple or orange. Pods pendulous, 15-20 cm long, narrow-linear. Seeds 20- 30.

Flowers during rainy season and fruits in winter.

Parts Used : Seeds, leaves and bark.

Therapeutic Uses : *Seeds* and *bark* : astringent, stimulant, emmenagogue and useful in menorrhagia, spleen enlargement and diarrhoea; *leaves*: juice anthelmintic and anti-inflammatory; *bark* juice beneficial in various cutaneous eruptions.

Chemical Constituents : The plant yields α- ketoglutaric, oxaloacetic and pyruvic acids, C_{29} and C_{31} alkanes, cholesterol, campesterol, β-sitosterol, galactomannan, vitamin C, palmitic, stearic, lignoceric, oleic, linoleic and linolenic acids (*Wlth India*, 1972, **9**, 300; *J. Amer. Oil chem. Soc.*, 1977, **56**, 904; *ibid.*, 1978, **71**, 622; *Chem. Abstr.*, 1979, **81**, 189830; *Physiol. Plant.*, 1979, **39**, 89; *Phytochemistry*, 1982, **22**, 161).

182. *Tephrosia purpurea* (L.) Pers.
syn. *T. hamiltonii* Drumm ex Gamble; *Cracca purpurea* L.

Vernacular Names : Sans : *Sharapunkha*; Hind : *Sarphonka*; Beng : *Ban-nil*; Tam : *Kolingi*; Eng : Wild Indigo.

शरपुंखो यकृत्प्लीह गुल्मव्रणविषापहः ।
तिक्तः कषायः कासास्रश्वासज्वरहरो लघुः ॥
(द्रव्यगुण)

śarapuṅkhō yakṛtplīha gulmavraṇaviṣāpaha: .
tikta: kaṣāya: kāsāsraśvāsajvaraharō laghu: ..
(dravyaguṇa)

It is efficacious in the treatment of diseases of liver and spleen, abdominal lump, ulcer; antidodal; *tikta*, *kashaya* and *laghu*; useful in cough, dyscrasia, dyspnea and fever.

Occurrence & Distribution : All over India, ascending up to an elevation of 1,850 m in the Himalayas.

Description : A suberect, much-branched, polymorphic, perennial herb, 30-60 cm in height. Leaves imparipinnate, 5-15 cm long; leaflets 9-21, glabrous above and obscurely silky beneath, narrow, oblanceolate. Flowers borne in leaf-opposed racemes, blue or purple. Pods linear, slightly curved, glabrescent. Seeds 5-10, smooth, greenish-grey.

Flowers during rainy season and fruits during Winter.

Parts Used : Whole plant, seeds, root-bark and root.

Therapeutic Uses : *Whole plant* : laxative and anthelmintic; *seeds* : infusion useful against worm infestation in children; oil specially recommended for external application in scabies and dermatosis; *root* : used in dyspepsia and chronic diarrhoea; *bark* : pounded with black pepper employed in refractory cholic.

Chemical Constituents : β-Sitosterol, lupeol, rutin, delphinidin chloride, cyanidin chloride, (−)isolonchocarpin, lanceolatins A and B, pongamol (lanceolatin C), karangin, kangone, 5,7-dimethoxy-8(2,3-epoxy-3-methylbutyl)-flavanone, 2-methoxy-3,9-dihydroxycoumestone, flevichapparins B and C, methyl karanjic acid and purpurin have been reported (*Quart. J. Crude Drug Res.*, 1975, **13**, 65; *Indian J. Chem.*, 1977, **15B**, 971; *Sci. & Cult.*, 1978, **44**, 322; *Phytochemistry*, 1979, **18**, 1581; *ibid.*, 1980, **19**, 1264; *Planta med.*, 1987, **53**, 220; *J. Indian chem. Soc.*, 1988, **65**, 148; *Phytochemistry.*, 1988, **27**, 648).

183. *Tephrosia villosa* Pers.

Vernacular Names : Sans : *Swet sharapunkha*; Beng : *Swet ban-nil*; Tam : *Punaikkaivettlai.*

शरपुंखा कटूष्णाच क्रिमिवातरुजापहा ।
श्वेता त्वेषा गुणाद्या स्यात् प्रशस्ता च रसायणे ।।
(राजनिघण्टु)

śarapuṅkhā kaṭūṣṇāca krimivātarujāpahā .
śvētā tvēṣā guṇādyā syāt praśastā ca rasāyaṇē ..
(rājanighaṇṭu)

It is *katu*, *ushna*, anthelmintic and cures diseases caused by the deranged *vata*. The white variety is most efficacious and considered to be a rejuvenator.

Occurrence & Distribution : In West Bengal, Bihar, Uttar Pradesh, Madhya Pradesh, Gujarat, Rajasthan and Punjab.

Description : A much-branched perennial herb, up to 90 cm in height and densely covered with white silky hairs. Roots light-brown, 50 cm long. Leaves 5.0-7.5 cm long; leaflets 9-19, persistently silky below, oblanceolate, grey-green. Flowers borne in erect racemes and pale pink. Pods much curved, 2.5-3.7 cm × 4- 5 mm, 6-8 seeded.

Flowers and fruits almost throughout the year.

Part Used : Leaves.

Therapeutic Uses : *Leaves* : juice beneficial in dropsy and diabetes.

Chemical Constituents : It contains 7-methylglabranin, tephrosol, tephrinone, villol, villinol, villosin, villosinol, villosol and villosone (*Tetrahedron Lett.*, 1977, 2125; *Phytochemistry*, 1980, **19**, 1267, 1272; *Curr Sci.*, 1981, **50**, 319).

184. *Teramnus labialis* Spreng.

Vernacular Names : Sans & Hind : *Mashaparni*; Beng : *Mashani*; Tam : *Kattualandu*.

माषपर्नी रसे तिक्ता वृष्या दाह ज्वरापहा ।
शुक्रवृद्धिकरी वल्या शीतला पुष्टिवर्द्धिनी ।।
(राजनिघण्टु)

māṣarpanī rasē tiktā vṛṣyā dāha jvarāpahā .
śukravṛddhikarī valyā śītalā puṣṭivarddhinī ..
(rājanighaṇṭu)

It is *tikta*; aphrodisiac; alleviates burning sensation and fever; spermatopoetic, invigorating, *sheetala* (*sheetaveerya*) and nutritive.

Occurrence & Distribution : From Punjab eastwards to West Bengal; grows wild in southern parts of India.

Description : A variable, climbing or wide-spreading hairy herb. Stems slender, somewhat adpressed, hairy. Leaves 3-foliolate, 6-12 cm long; leaflets

membranous or subcoriaceous, ovate-oblong, lateral oblique, terminal slightly larger, 2.0-2.5 cm × 3.8-6.3 cm. Flowers borne in lax axillary racemes, minute, pink, purple, red or white. Pods narrow, elongated, hooked, papery. Seeds 8-10, smooth, oblong, slightly rounded or truncate, dark brown.

Flowers during Septermber-October and fruits during November- December.

Part Used : Fruits.

Therapeutic Uses : *Fruits* : astringent, antipyretic, stomachic and nervine tonic; beneficial in rheumatism, paralysis, haemoptysis, tuberculosis and catarrh.

185. *Trigonella foenum-graecum* L.

Vernacular Names : Sans : *Methika*; Hind & Beng : *Methi*; Tam : *Vendayam*; Eng : Fenugreek.

मेथिका कटुरुष्णा च रक्तपित्त प्रकोपनी ।
अरोचकहरा दीप्तिकरा वातघ्नदीपनी ॥
(राजनिघण्टु)

mēthikā kaṭuruṣṇā ca raktapitta prakōpanī .
arōcakaharā dīptikarā vātaghnadīpanī ..
(rājanighaṇṭu)

It is *katu, ushna*; causes haemorrhagic diseases; efficacious in anorexia, induces radiance; subdues deranged *vata*; gastric stimulant.

Occurrence & Distribution : Wild in Kashmir, Punjab and the upper Gangetic plains. Widely cultivated in many parts of India.

Description : An erect aromatic annual herb, 30-60 cm tall. Leaves pinnate, 3-foliolate; leaflets obscurely dentate, oblanceolate-oblong, 2.0-2.5 cm long. Flowers axillary, 1 or 2, white or yellowish-white. Pods beaked, turgid, 3-15 cm long. Seeds 10-20, oblong with a deep groove across one corner, greenish-brown, 2.5-5.0 mm × 2.0-3.5 mm.

Flowers during January and fruits in March.

Chemical Constituents : The endosperm of the seed is rich in galactomannan (14-15%); young seeds mainly contain carbohydrates and sugar; mature seeds yield amino acids (including 4-hydroxy isoleucine) and fatty acids on hydrolysis; carotene, vitamins, saponins, *viz*., graecunins H-N, being glycosides of diosgenin differing in the sugar units attached, fenugrin B and sapogenins (as glycoside or

free), such as diosgenin, gitogenin, neogitogenin, homoorientin, saponaretin, neogigogenin and tigogenin, vicenins 1 and 2, vitexin and isovitexin, yamogenin and its tetrosides B and C; trigonelloside C, 3,26-bisglycoside, flavone-C-glycoside-vitexin-2″-O-*p*-coumarate, the alkaloids, trigonelline (methylbetaine of nicotinic acid) and choline besides 7-acetoxy-4-methyl coumarin; furastanol glycosides, kaempferol, luteolin, quercetin. Leaves give saponins, *viz.*, diosgenin and its glycoside (graecunin B), graecunins A and C, gitogenin, tigogenin; kaempferol, quercetin and β-sitosterol (*J. Indian chem. Soc.*, 1966, **43**, 564; *Indian J. Pharm.*, 1975, **37**, 100; *Wlth India*, 1976, **10**, 299, CSIR, New Delhi; *Khim. Prir. Soedin*, 1976, **12**, 268; *Chem. Abstr.*, 1976, **85**, 106634; *Khim. Farm. Zh.*, 1976, **10**, 70; *Chem. Abstr.*, 1976, **85**, 68172; *Phytochemistry*, 1976, **15**, 351; *Indian J. Pharm.*, 1977, **39**, 62; *Indian J. Chem.*, 1977, **15B**, 94; *J Indian chem. Soc.*, 1977, **54**, 1135; *Indian J. Chem.*, 1978, **16B**, 1134; *Phytochemistry*, 1984, **23**, 2605).

186. *Uraria lagopodioides* Desv. syn. *U. lagopoides* DC.

Vernacular Names : *Sans : Prisniparni*; Hind : *Pithvan*; Beng : *Chakulia.*

पृश्निपर्णी कटूष्णाम्ला तिक्तातिसारकासजित् ।
वातरोगज्वरोन्मादव्रणदाहविनाशनी ॥
(राजनिघण्टु)

pṛśniparṇī kaṭūṣṇāmlā tiktātisārakāsajit .
vātarōgajvarōnmādavraṇadāhavināśanī ..
(rājanighaṇṭu)

It is *katu*, *ushna*, *amla* and *tikta*; useful in diarrhoea, cough, diseases caused by deranged *vata*, fever, insanity, ulcer and burning sensation.

Occurrence & Distribution : Commonly found in the grasslands in West Bengal, Bihar and Orissa as well as in the Palni hills in the Western Ghats.

Description : An erect herb or undershrub, with ascending and prostrate branches. Leaves 3-foliolate or sometimes simple, broadly oblong or roundish; leaflets cordate, oblong, rhomboid or truncate. Flowers borne in short dense racemes, white. Pods oblong.

Flowers during rainy season and fruits during winter.

Parts Used : Whole plant and root.

Therapeutic Uses : *Whole plant* : alterative, tonic and anticatarrhal (mostly used in combination); intermittent fever and inflammation of chest; *leaves* : decoction in diarrhoea; *root* : one of the ten ingredients of the *Dashamula kwaath*: decoction used in rheumatism, fever, catarrh and bleeding piles.

Chemical Constituents : 5-Hydroxy-7,4′-dimethoxy flavonol and five other flavonoids have been reported (*Jinam Liyi Xuebao*, 1986, **1**, 85, *Chem. Abstr.*, 1986, **105**, 149734).

187. *Uraria picta* (Jacq.) Desv. ex DC.
syn. *Hedysarum pictum* Jacq.

Vernacular Names : Sans : *Prasniparni*; Hind : *Dabra*; Beng : *Sankarjata*; Tam : *Sittirappaladai.*

Occurrence & Distribution : In the dry grasslands, waste places and open forests in the sub-Himalayan tract from Kashmir to Assam, up to an altitude of 1,800 m and throughout the plains of India.

Description : An erect little-branched herb or undershrub, 90-180 cm tall. Leaves variable, 1-3 foliolate, blotched white, usually 10-15 cm long; leaflets 4-6 (rarely 2-9), lanceolate or linear-oblong, mucronate, obtuse; stipules subulate. Flowers borne in dense cylindrical racemes, purple. Pods glabrous, turgid, polished, 3-6, jointed, often whitish. Seeds 1-12, reniform, reddish.

Flowers during rainy season and fruits in winter.

Parts Used : Pods and root.

Therapeutic Uses : *Pods* and *root* : For prolapse of anus in infants; *pods* : in sore mouth; *root* : decoction beneficial in cough, chills and fever.

188. *Vigna mungo* (L.) Hepper
syn. *Phaseolus mungo* (L.) Mant.

Vernacular Names : Sans : *Masha*; Hind : *Urd*: Beng : *Mash-kalai*; Tam : *Ulundu*; Eng : Black gram.

माषो गुरुः स्वादुपाकः स्निग्धो रुच्योनितापहः ।
उष्णः सन्तर्पणो वल्यः शुक्रलो वृंहणः परः ।।
(द्रव्यगुण)

māṣō guruḥ svādupākaḥ snigdhō rucyōnilāpahaḥ
uṣṇaḥ santarpaṇō valyaḥ śukralō vṛṃhaṇaḥ paraḥ ..
(dravyaguṇa)

It is *guru*, *svadupaka* (*madhuravipaka*) and *snigdha*; appetizing; pacifies deranged *anila* (*vata*); *ushna*, palatable, invigorating, spermatopoetic and nutritive.

Occurrence & Distribution : Grown throughout India as a pulse crop.

Description : An erect pubescent herb, 30-90 cm tall, sometimes long and twinning. Leaves 3-foliolate; leaflets entire, acuminate, ovate to rhombic-ovate, 5-10 cm long. Flowers yellow, small, borne in short but later elongating peduncles. Pods erect or spreading, cylindrical, provided with a very short hooked beak and long hairs. Seeds 1-4, oblong with square ends, generally black or greenish-black with a white hilum but concave in the middle.

Flowers in September-October and fruits in November-December.

Parts Used : Seeds and root.

Therapeutic Uses : *Seeds* : cooling, astringent, diuretic; used as a diet in fever; beneficial in rheumatism, dropsy, nervous and hepatic diseases; *root* : narcotic.

Chemical Constituents : It contains genistein, 2′-hydroxy-genistein, 2′-hydroxydaidzein, kievitone, dalbergioidin, cyclokievitone, 5- deoxykievitone, 2′-hydroxydihydrodaidzein, isoferreirin, eurenol, glycinol, demethylvesititol, kievitone hydrate, 4′-O-methylkievitone, cyclokievitone hydrate, 5-deoxy-kievitone hydrate, hemicellulose A, hemicellulose pectin, starch and hexosans (*Z. Naturforsch.*, 1984, **39C**, 888; *Chem. Abstr.*, 1985, **102**, 59298; *Cereal Chem.*, 1986, **63**, 376; *Chem. Abstr.*, 1986, **105**, 224850).

189. *Vigna trilobata* (L.) Verdcourt
syn. *Phaseolus trilobatus* (L.) Schreb.;
P. trilobus sensu Ait.; *Dolichos trilobatus* (L.) Mant.

Vernacular Names : Sans : *Mudgaparni*; Hind : *Rakhalkalai*; Beng : *Mugani*; Tam : *Panipayer*.

मुद्गपर्णी हिमा कासवातरक्तक्षयापहा ।
पित्तदाहज्वरान् हन्ति चक्षुष्या शुक्रवृद्धिकृत् ॥
(राजनिघण्टु)

mudgaparṇī himā kāsavātaraktakṣayāpahā .
pittadāhajvarān hanti cakṣuṣyā śukravṛddhikṛt ..
(rājanighaṇṭu)

It is *hima (sheetaveerya)*; cures cough, gout, emaciation, beneficial in deranged *pitta*, alleviates burning sensation; antipyretic, spermatopoietic; useful in opthalmic diseases.

Occurrence & Distribution : Cultivated or grows wild throughout India, ascending up to an elevation of 2,100 m in the north-east.

Description : An annual or perennial herb. Stems slender, trailing, glabrous or with a few deciduous hairs, 30-60 cm long. Leaflets somewhat deeply 3-lobed, membranous, ovate or rhomboid, glabrous or with a few short hairs; the

central division spathulate, very rarely entire. Pods glabrous, recurved, subcylindrical, 2.5-3.2 mm long. Seeds nearly flat, cylindrical to oblong, truncate at each end, hilum concave, seed-coat black or mottled brown.

Flowers and fruits during winter.

Parts Used : Whole plant and leaves.

Therapeutic Uses : *Whole plant* : as febrifuge; *leaves* : sedative, cooling, antibilious, tonic; paste useful in opthalmia and haemorrhoids; decoction used in intermittent fever.

Chemical Constituents : Friedelin, epifriedelin, stigmasterol and tannins (*J. Res. Indian Med. Yoga Homoeop.*, 1976, **11**, 119; *Indian J. exp. Biol.*, 1978, **16**, 330; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, **2**, 401, ICMR, New Delhi).

XLV. Bixaceae

190. *Bixa orellana* L.

Vernacular Names : Hind & Beng : *Latkan*; Tam : *Japhara*; Eng : Annatto tree.

Occurrence & Distribution : Wild in Kerala, Coromondal and Malabar coasts and in certain districts of Assam, West Bengal and Maharashtra. Cultivated to a small extent in Mysore.

Description : A small evergreen tree. Leaves cordate, acuminate, veins curved, more longer than broad. Flowers pink or white in terminal panicles. Fruit

an ovoid or subglobose capsule, softly echinate. Seeds 50, small, trigonous, with a pulpy outer covering.

Occurs in two forms : one with white flowers and green capsules and the other with pink flowers and red capsules.

Flowers in summer and fruits in early winter.

Parts Used : Fruits, seeds, leaves and root-bark.

Therapeutic Uses : *Fruits* : astringent and purgative; *seeds* : astringent, febrifuge, remedy for gonorrhoea; *leaves* : in jaundice; *root-bark* : antiperiodic and antipyretic.

Chemical Constituents : Bixin, a carotenoid pigment is the principal colouring matter in the seeds from which orellin, methylbixin, β-carotene, cryptoxanthin, zeaxanthin and lutein have also been reported. The seed oil contains palmitic, stearic and oleic acids. The essential oil from the seeds and leaves yield ishwarone, bixaghanene (ishwarane). Ellagic acid, 7-bisulphates of apigenin and luteolin, 8-bisulphate of hypolaetin, apigenin-7-glucoside, luteolin and bixorellin in the leaves, a steroidal sapogenin in the stem-bark and tomentosic acid in the root have been encountered (*Wlth India*, 1988, **2B**, 159, CSIR, New Delhi).

XLVI. Tamaricaceae

191. *Tamarix dioica* Roxb.

Vernacular Names : Sans : *Pisula*; Hind & Beng : *Lal-jhau;* Tam : *Nirumari.*

Occurrence & Distribution : Throughout northern India along the Ganges and near the sea-coast in Tamil Nadu ascending to an elevation of 750 m.

Description : A gregarious shrub or small tree, up to 2 m in height. Branches drooping. Bark red, cracking. Wood moderately hard, reddish-brown. Leaves closely adpressed, acuminate, obliquely truncate, sheathing with a broad white margin. Flowers in dense peduncled spikes, white, pink or purple. Capsules conical or oblong.

Parts Used : Twigs and galls (abnormal growth on the plant caused by insects and globular in shape).

Therapeutic Uses : *Twigs* and *galls* : astringent.

Chemical Constituents : Tamarixetin, kaempferide, quercetin and D-mannitol have been isolated from the leaves of the plant (*Indian J. Chem.*, 1967, **5**, 171; *Wlth India*, 1976, **10**, 123, CSIR, New Delhi).

192. *Tamarix troupii* Hole
syn. *T. gallica* auct. non L.

Vernacular Names : Sans : *Jhavuka*; Hind & Beng : *Jhau*; Tam : *Sirusavakku.*

Occurrence & Distribution : In Punjab, Uttar Pradesh, Bihar and West Bengal, particularly along marshy land and river side.

Description : A gregarious bushy shrub. Bark brownish, smooth when young and rough when mature. Wood fairly hard and tough, white and occasionally with a red tinge. Leaves minute, rhombic-ovate, acute, keeled, glaucous, not

sheathing. Flowers borne in slender panicled racemes, pink or white. Capsules conical, somewhat trigonous, tapering, pale-pink. Seeds with a plume of white hairs.

Flowers in July-August and fruits in winter.

Parts Used : Galls and manna (gummy exudation).

Therapeutic Uses : *Galls* : astringent, given internally in dysentery and diarrhoea; pulverised galls mixed with vaseline useful in piles and anal fissure; decoction applied to foul and sloughing ulcers and infusion used as a gargle for sore throat; *manna* : mild laxative and expectorant.

Chemical Constituents : Galls contain tannin (45%). Leaves yield tamarixin, tamauxetin, troupin, 4-methylcoumarin and 3,3′-di-O-methylellagic acid (*Indian J. Chem.*, 1965, **3**, 48, 171; *Wlth India*, 1976, **10**, 124, CSIR, New Delhi; *Phytochemistry*, 1985, **24**, 871).

XLVII. Caricaceae

193. *Carica papaya* L.

Vernacular Names : Sans : *Parisha*; Hind : *Papita*; Beng : *Penpe*; Tam : *Pappayi*; Eng : Papaya tree.

पारीशं शीतलं रुच्यम् दीपनं पाचनं सरम् ।
मधुरं रक्तपित्तघ्नं विशेषादर्शसे हितम् ।
पारीशक्षीरयोगेन प्लीहागुल्मश्च नश्यति ॥

(द्रव्यगुण)

pārīśaṃ śītalaṃ rucyam dīpanaṃ pācanaṃ saram .
madhuraṃ raktapittaghnaṃ viśēṣādarśasē hitam .
pārīśakṣīrayōgēna plīhāgulmaśca naśyati ..

(dravyaguṇa)

It is *sheetala* (*sheetaveerya*), appetizing, gastric stimulant, digestive, *sara* and *madhura*; cures haemorrhagic diseases; specially beneficial in piles. Its latex combined with other ingredients helps to cure spleenomegaly and abdominal lump.

Occurrence & Distribution : Cultivated throughout India.

Description : An erect tree, 6.1-7.6 m in height, with spongy trunk and milky sap. Leaves palmipartite, long-petioled; petiole 91 cm long. Dioecious or

monoecious (though bisexual flowers may occur). Flowers fascicled, males laxly panicled and females fascicled. Fruits cylindrical or spherical, borne near the top of the trunk, closely packed at the base of leaves. Seeds many, grey and black.

Flowers and fruits throughout the year.

Parts Used : Fruits, seeds and leaves.

Therapeutic Uses : *Fruits* : laxative, digestive, stomachic, carminative, diuretic and alterative; *milky juice* (latex of green fruit) : anthelmintic particularly effective in expulsion of lambricoids; beneficial in liver enlargement, ringworm affections and diarrhoea; removes freckles and other blemishes from the skin; *dessicated latex* : a digestant of commerical importance; *seeds* : vermifuge, anthelmintic, emmenagogue and allay thirst; *leaves* : juice useful as febrifuge and in cardiac diseases.

Chemical Constituents : Latex of the unripe fruits yields papain, a proteolytic enzyme, chymopapain, pectin and malic acid. The fruits also contain protein, sugars, cryptoxanthin, violaxanthin, zeaxanthin, β-carotene, neo-β-carotene B and U, ascorbic acid, thiamine, riboflavine and other vitamins. Carpasemine (benzylthiourea) has been isloated from the seeds. Leaves contain carposide, carpaine, pseudocarpaine, dehydrocarpines I and II (*Wlth India*, 1950, **2**, 79, CSIR, New Delhi; *Indian J. Chem.*, 1964, **2**, 451; *J. Org. Chem.*, 1965, **30**, 3420; *Tetrahedron Lett.*,1965, **24**, 1907; *Phytochemistry*, 1979, **18**, 651).

XLVIII.Theaceae

194. *Schima wallichii* Choisy.

Vernacular Names : Hind : *Chilauni*; Beng : *Makrisal*; Eng : Needle wood.

Occurrence & Distribution : In the eastern Himalayas from Nepal eastwards to Assam, Khasi Hills and Manipur up to a height of 1600 m.

Description : A large evergreen tree, up to 30 m in height and 3.5 m in girth. Bark with deep vertical cracks, dark grey or black. Sapwood dirty-white to greyish-white, but heartwood light red to reddish-brown. Leaves variable, entire or prominently serrate oblong to lanceolate or ovate or obovate. Flowers axillary, solitary, fragrant, white. Fruit a 5-celled globose loculicidal capsule, 1.9 cm in diam.

Flowers during April-May and fruits during November-December.

Part Used : Stem-bark.

Therapeutic Uses : *Stem bark* : anthelmintic and rubifacient.

Chemical Constituents : A mixture of hydrocarbons, tannins, a fatty acid, octacosanol, schiwallin, phytol, α-spinosterol, primulagenin-A, angelates of dihydropriverogenin, barrigenols-A_1 and R_1 and barringtogenol-C have been reported (*Wlth India*, 1972, **9**, 246, CSIR, New Delhi; *Indian J. pharm. Sci.*, 1978, **40**, 228; *Indian J. Chem.*, 1980, **19B**, 283).

XLIX. Dipterocarpaceae

195. *Dipterocarpus costatus* Gaertn. f.
syn. *D. alatus* sensu Dyer; *D. angustifolius* W. & A.

Vernacular Names : Hind & Beng :*Garjan;*Tam : *Yennai*; Eng : Gurjun.

Occurrence & Distribution : Found in the Andaman Islands.

Description : A tall tree with grey bark. Wood white outside and reddish-grey inside. Buds cylindric. Leaves coriaceous, wedge-shaped or truncated at the

base, 10.2-15.2 cm long, veins in 12-15 pairs; pedicel 2.5-3.8 cm long, hairy. Flowers 3.8 cm long; calyx-lobes enlarged.

Flowers from November-December and fruits ripen in April.

Parts Used : Bark and resin.

Therapeutic Uses : *Bark* : tonic and depurative and the decoction prescribed in rheumatism; *resin*: applied externally in gonorrhoea; oil (from the resin) externally applied to ulcers and other cutaneous affections.

Chemical Constituents : Oleo-resin derived from the plant contains 71.6% volatile oil. Sesquiterpenes, α- gurjunene, calarene, alloaromadendrene and the triterpene, damarenediol have been reported (*Wlth India*, 1952, **3**, 95, CSIR, New Delhi; *Phytochemistry*, 1966, **5**, 865).

196. *Dipterocarpus turbinatus* Gaertn. f.

Vernacular Names : Beng : *Teli-garjan*; Eng : Common Gurjun tree.

Occurrence & Distribution : Found in the semi-evergreen or evergreen moist tropical forests of Tripura, Assam and the Andamans.

Description : A lofty tree, 36.6-45.7 m high with a girth of 3.0- 4.6 m. Wood dull red or reddish-brown, coarse-textured. Young branches cylindric, canescent. Leaves coriaceous, acute, elliptic-lanceolate, serrate, 11.4-15.2 cm long; pedicel 5.1 cm long, hairy; Calyx-tube in fruit neither ribed nor winged.

Flowers during November-December and fruits in April.

Part Used : Oleo-resin (balsamic exudation from the trunk).

Therapeutic Uses : *Oleo-resin* : diuretic; specially recommended for tuberculoid leprosy; psoriasis, indolent ulcers and gonorrhoea.

Chemical Constituents: Resin furnishes essential oils containing α- and β-gurjunene and gurjunic acid. The presence of sesquiterpenes, calarene, alloaromadendrene and copaene have also been reported. Twig-bark yields tannin and dipterocarpol occurs in wood (*Wlth India*, 1952, **3**, 94; *Phytochemistry*, 1966, **5**, 865; *J. Indian chem. Soc.*, 1973, **50**, 571).

197. *Shorea robusta* Gaertn. f.

Vernacular Names : Sans : *Aswakarna*; Hind & Beng : *Shal*; Tam : *Kungiliyam*; Eng : Sal.

अश्वकर्णः कटुस्तिक्तः स्निग्धः पित्तास्रनाशनः ।
ज्वरविस्फोटकण्डूघ्नः शिरोदोषार्त्तिकृन्तनः ॥
(राजनिघण्टु)

aśvakarṇa: kaṭustikta: snigdha: pittāsranāśana: .
jvaravisphōṭakaṇḍūghna: śirōdōṣārttikṛntana: ..
(rājanighaṇṭu)

It is *katu*, *tikta*, *snigdha*; beneficial in haemorrhagic diseases, fever, boils, pruritus and headache.

Occurrence & Distribution : Found largely from Punjab along the sub-Himalayan tract to Garo, Khasi and Jaintia Hills, West Bengal, Bihar, Orissa, Andhra Pradesh and Madhya Pradesh.

Description : A large sub-deciduous tree, seldom leafless. Bark smooth or longitudinally fissured, grey or reddish-brown. Leaves coriaceous, lustrous when mature, ovate-oblong, 10-30 cm × 5-18 cm. Flowers hairy, soft, small, borne in axillary or terminal lax panicles, yellowish. Fruit indehiscent, ovoid, 10-15 mm long and 10 mm diam., reddish to pale yellowish-green, one-seeded with five somewhat unequal winged persistent sepals (5.0-7.0 cm long). Seeds ovoid, with fleshy unequal cotyledons.

Flowers in March and fruits during May-June.

Part Used : Stem-bark.

Therapeutic Uses : *Stem-bark* : exuded resin : astringent, anti-diarrhoeal and anti-dysenteric.

Chemical Constituents : Presence of 2-(2-iminoacetic acid)-3-(2H)-benzofuranone, glucoside of 4′-hydroxychalcone, leucoanthocyanidin, hopeaphenol, triterpenoids and a terpene alcohol, furfural, monomethylether and dimethyl ether of homocatechol, alkylbenzene derivatives, pentosans, lignan, tannin, amino-acids and fatty acids have been reported (*Wlth India*, 1972, **9**, 313, CSIR, New Delhi; *Heterocycles*, 1979, **12**, 1281; *Phytochemistry*, 1982, **21**, 957).

L. Dilleniaceae

198. *Dillenia indica* L.

Vernacular Names : Sans : *Bhavya*; Hind & Beng : *Chalta*; Tam : *Uva*; Eng : Dillenia.

भव्यमम्लं कटूष्णं च वातं वातकफापहम् ।
पक्वन्तु मधुराम्लं च रुचिकृत् सामशूलहृत् ॥
(राजनिघण्टु)

bhavyamamlaṃ kaṭūṣṇaṃ ca vālaṃ vātakaphāpaham
pakvantu madhurāmlaṃ ca rucikṛt sāmaśūlahṛt ..
(rājanighaṇṭu)

Green fruits are *amla*, *katu*, *ushna*; subdue *vata* and *kapha*; the ripe ones are *madhura*, *amla*, appetizing and beneficial in colic caused by *ama*.

Occurrence & Distribution : in the moist evergreen forests of sub-Himalayan tract from Garhwal, Kumaon, Assam, West Bengal, Central and Southern India.

Description : An evergreen tree, 9.1-42.7 m in height, with a dense round crown. Bark cinnamomum-like. Leaves simple, large, oblong-lanceolate, serrate, parallel-nerved from midrib, 25.4- 30.5 cm; pedicel 3.8 cm long. Flowers large, solitary, white. Carpels 20. Fruits globose, with an accrescent calyx, 12.7-15.2 cm diam. Seeds many, embedded in hairy cells.

Flowers during May-June and fruits from July-August.

Parts Used : Fruits, leaves and bark.

Therapeutic Uses : *Fruits* : mild laxative; in abdominal pains but induces diarrhoea if frequently taken; ripe fruits are appetizing; juice mixed with sugar and water finds application as a cooling beverage in fevers and as a cough mixture; *leaves* and *bark* ; astringtent.

Chemical Constituents : It contains betulin, betulinaldehyde, betulic acid and its hydroxylactone, 3β-hydroxy-lupane-13β-28-lactone, 3β, 28- diacetoxy-lupane, myricetin, kaempferide, isorhamnetin, dillenetin, naringenin, 3-O-methyltaxifolin, mallic acid, glucose and tannin, sitosterol, 3′, 5′-dihydroxy-4′, 3-dimethoxyflavone-7-O-β-D-glucopyranoside, 4,5,7,3′,4′-pentahydroxyflavone-3-O-β-D-glucopyranoside, 5,7-dihydroxy-4′-methoxyflavone-3-O-β-D-glucopyranoside and 1,8-dihydroxy-2- methylanthraquinone-3-O-β-D-glucopyranoside (*Wlth India*, 1952, **3**, 64, CSIR, New Delhi; *Phytochemistry*, 1975, **14**, 1127, 1447; *Acta chem. Scand.*, 1978, **32B**, 623; *Planta med.*, 1979, **35**, 188).

LI. Flacourtiaceae

199. *Casearia tomentosa* Roxb.

Vernacular Names : Sans : *Chilhaka*; Hind & Beng : *Chilla*; Tam ; *Kadichai.*

चिल्हको वातनिर्हारः श्लेष्मघ्नो धातुपुष्टिकृत् ।
आग्नेयो विषवद्यस्य फलं मत्स्यनिषूदनम् ॥
(भावप्रकाश)

cilhakō vātanirhāra: ślēṣmaghnō dhātupuṣṭikṛt .
āgnēyō viṣavadyasya phalaṃ matsyaniṣūdanam ..
(bhāvaprakāśa)

It pacifies deranged *vata* and *sleshma*; nutritious and digestive. Fruit acts as fish-poison.

Occurrence & Distribution : Common in South and Central India, the sub-Himalayan tract and also in Bihar.

Description : A small tree, with tomentose branchlets and leaves, 0.61-1.52 m in height. Leaves distichous, serrate, cuneate, elliptic-oblong or lanceolate; pedicel small or long (15.2 cm). Flowers tomentose, small, clustered in axils, greenish-yellow. Fruit a broad, ellipsoid, succulent capsule. Seeds many, angular or obovoid, with a fleshy, usually coloured aril.

Flowers and fruits from March to May.

Parts Used : Fruits and bark.

Therapeutic Uses : *Fruits* : diuretic; *bark* : applied externally in dropsy; decoction stimulates the liver function.

Chemical Constituents : Bark contains tannin (*Wlth India*, 1950, **2**, 92).

200. *Flacourtia jangomas* (Lour.) Raeusch.
syn. *F. cataphracta* Roxb. ex Willd.; *Stigmarota jangomas* Lour.

Vernacular Names : Sans : *Prachinamalak*; Hind & Beng : *Paniala*; Tam : *Saralu*; Eng : Puneala plum.

प्राचीनामलकं दोषत्रयजित् ज्वरघाति च ।।

(भावप्रकाश)

prācīnāmalakaṃ dōṣatrayajit jvaraghāti ca ..

(bhāvaprakāśa)

The plant subdues deranged *tridosha* and is antipyretic.

Occurrence & Distribution : Northeastern region, West Bengal, Orissa, Andhra Pradesh and Eastern Ghats.

Description : A small dioecious shrub or spreading tree, 6.1-9.1 m in height, with sharp decompound spines on trunk. Bark smooth, grey. Wood rather hard, orange or red. Branches many, near the trunk spiny. Leaves ovate-elliptic, acuminate, serrate, green, 5.1-7.6 cm × 2.5-4.5 cm. Fruit ellipsoid, dark-red or purple when ripe, edible; flesh firm, fairly juicy, brownish-green.

Flowers during July-August and fruits during October-December.

Parts Used : Fruits, leaves and bark.

Therapeutic Uses : *Fruits* : for liver complaints; *leaves* : diaphoretic, astringent and stomachic; juice of fresh leaves or of young shoots useful in infantile fever; *bark* : decoction applied in biliousness; infusion used as a gargle in hoarseness.

Chemical Constituents : Fruits and seeds yield protein, vitamins, fructose, glucose, sucrose, tartaric acid, ascorbic acid, fatty acids and amino acids. Stem and bark contain jangomolide, ostruthin and limonin (*Wlth India*, 1956, **4**, 42, CSIR, New Delhi; *Phytochemistry*, 1984, **23**, 1269; *Food Chem.*, 1987, **26**, 253; *Chem. Abstr.*, 1988, **108**, 36483; *J. Fd. Sci. Technol.*, 1989, **26**, 334; *Chem. Abstr.*, 1990, **112**, 234172).

201. *Flacourtia indica* (Burm. f.) Merr.
syn. *F. ramontchi* L'Herit.; *F. latifolia* Cooke; *F. occidentalis* Blatter.

Vernacular Names : Sans : *Svadukantaka*; Hind : *Kanju*; Beng : *Bainchi*; Tam : *Katukala*; Eng : Madagascar plum.

Occurrence & Distribution : In the sub-Himalayan tract and outer Himalayas up to 1,219 m; common throughout Bihar, West Bengal, Orissa and Southern India in mixed deciduous or scrub forests.

Description : A small deciduous tree or shrub, generally thorny. Bark slightly white and grey. Wood hard, red. Leaves variable in size and shape, soft, elliptic-ovate, acuminate, serrate. Flowers small. Fruits globose, dark purple or red (black when ripe) and edible with a sharp sweet taste and an agreeable flavour; juicy pulp around several small seeds.

Flowers in March and fruits in April.

Parts Used : Fruits and bark.

Therapeutic Uses : *Fruits* : digestive; remedy for hepatitis and spleenomegaly; *bark* : astringent and diuretic.

Chemical Constituents : Fruits contain protein and sucrose; bark yields tannin and flacourtin, a phenolic glucoside ester (*Wlth India*, 1956, **4**, 42, CSIR, New Delhi; *Phytochemistry*, 1987, **26**, 3090).

202. *Flacourtia sepiaria* Roxb*.

Vernacular Names : Sans : *Vikankata*; Hind : *Kondai*; Tam ; *Kodumundi*.

विकंकतोम्लो मधुरः पाकेतिमधुरो लघुः ।
दीपनः कामलाघ्नः पाचनः पित्तनाशनः ॥
(राजनिघण्टु)

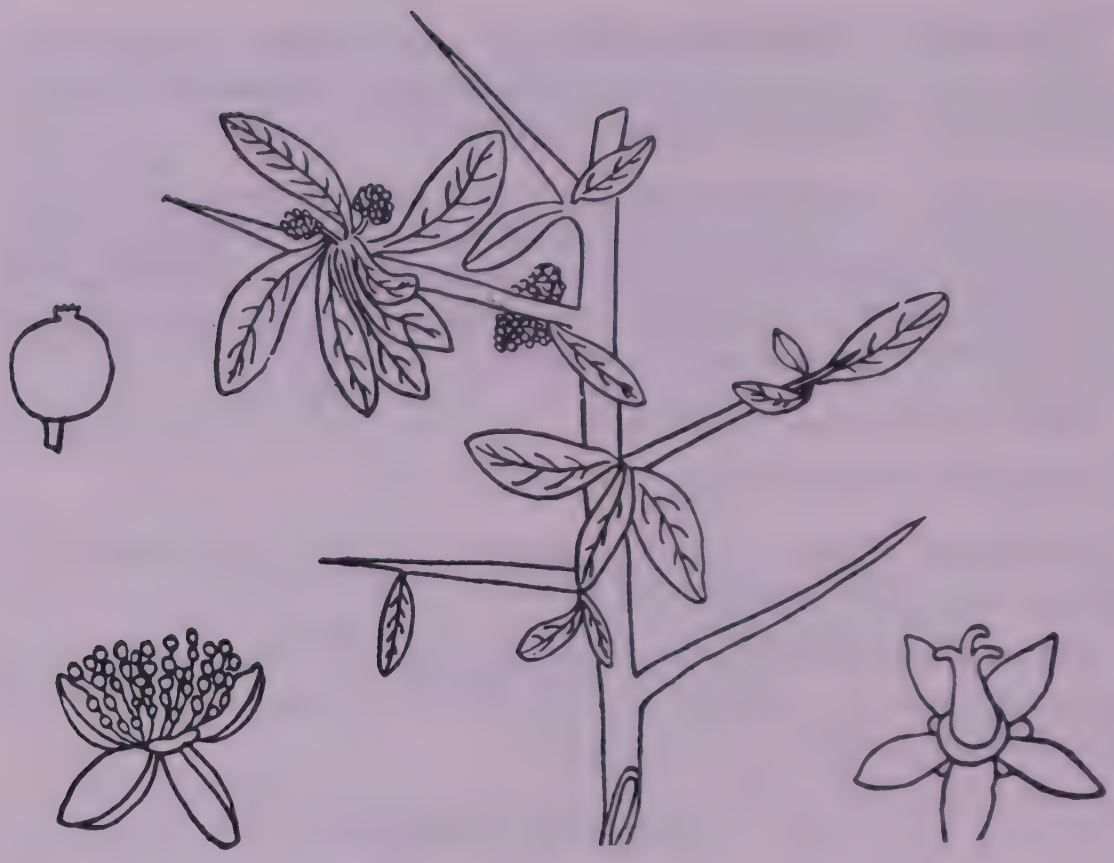
vikakantōmlō madhura: pākētimadhurō laghu: .
dīpana: kāmalāsraghna: pācana: pittanāśana: ..
(rājanighaṇṭu)

Fruits are *amla*, *madhura* and *madhura-vipaka*; *laghu*; gastric stimulant; beneficial in jaundice and dyscrasia. It is digestive and subdues deranged *pitta*.

Occurrence & Distribution : Found in Kumaon as well as dry forests of West Bengal, Bihar, Orissa and South India.

Description : A small rigid shrub, with many spreading branches and sharp spines up to 5.0 cm long; the spines often bearing clusters of leaves and flowers.

* The taxonomic position of *Flacourtia indica* and *F. sepiaria* has been discussed by S.S.R. Bennet (*Name Changes in Flowering Plants of India and Adjacent Regions*, 1987, 243, Triseas, Dehra Dun, India).



Bark slightly yellow and red. Wood hard, reddish. Leaves elliptic-ovate, serrate, narrow towards the stalk. Flowers small, borne separately or in clusters, very soft, yellowish. Fruits globular, smooth, brown, of the size of a large pea. Flowers and fruits from the base of spine.

Flowers and fruits during February-April.

Part Used : Leaves, stem-bark and root.

Therapeutic Uses : *Leaves* and *root* : antidotal to snake-bite, aqueous extract of leaves used as a gargle in gum inflammation; ***stem-bark*** : triturated in sesamum oil used as a liniment in gout and rheumatism.

203. *Gynocardia odorata* R.Br.

Vernacular Names : Sans: *Kusthapa*; Hind & Beng : *Chaulmoogra**.

* The reported Ayurvedic remedy for leprosy, known as *Chaulmoogra oil* was earlier believed to be derived from the seeds of *Gynocardia odorata*, *Hydnocarpus kurzii* and *Hydnocarpus laurifolia*. As such, all the three species were known as *Chaulmoogra*. Prain (1901), however, showed that the *Chaulmoogra oil* is not obtained from *G. odorata*, the seed oil of which was also found to have completely different physical properties and chemical composition by Power and Barrowchiff (1905). Among the two *Hydnocarpus* species, the latter is considered to be therapeutically more efficacious against leprosy.

Occurrence & Distribution : In the forests of Sikkim and Khasi Hills.

Description : An evergreen, glabrous, dioecious tree, 9.1-15.2 m in height and 0.91-1.8 m in girth, with a clear bole up to 6.1 m. Branches slightly drooping, slender. Bark greenish-grey, 0.6 cm thick. Wood hard, tough, pale yellow to light brown. Leaves bifarious, ovate-oblong. Flowers borne in fascicles, fragrant, pale yellow. Fruits borne on trunk and main branches, globose (7.6-12.7 cm diam.) with hard rind. Seeds oblong or obovoid, embedded in a gelatinous pulp, 2.5 cm long.

Flowers and fruits during summer-rainy season.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : oil insecticidal; used in leprosy and other cutaneous affections; applied internalliy in scrofula, scabies, chronic rheumatism, secondary syphilis and externally on chest as an expectorant.

Chemical Constituents : Seed-oil contains palmitic, linoleic, linolenic, isolinolenic and oleic acids, besides phytosterols. Seed-kernel yields cyanogenetic glucoside, gynocardin. Three fridelane lactones, *viz.*, odolactone, O-actylodollactone and odollactone, have been reported from the bark (*Wlth India*, 1956, **4**, 280, CSIR, New Delhi; *Tetrahedron Lett.*, 1984, **25**, 865).

204. *Hydnocarpus kurzii* (King) Warb.
syn. *H. heterophyllus* Kurz; *Taraktogenos kurzii* King

Vernacular Names : Hind & Beng : *Chaulmoogra.*

Occurrence & Distribution : Common in evergreen forests throughout upper Assam and in Tripura, frequently forming gregarious patches.

Description : A tree up to 15.2 m in height, with tall trunk and narrow crown of hanging branches. Leaf alternate, oblong, or elliptic, coriaceous, abruptly acuminate, 17.8-20.3 cm; petiole geniculate at the upper end. Flower mostly dioecious, borne in axillary cymes, pale yellow. Fruit globose, chocolate-brown, 6.3- 7.6 cm across. Seed many, faceted, with copious albumin (as hard as wood).

Flowers in May-June and fruits in November-December.

Part Used : Seed.

Therapeutic Uses : *Seeds* : oil used both internally and externally in leprosy and many other skin diseases.

Chemical Constituents : Seeds yield chaulmoogric, hydnocarpic, gorlic, palmitic and oleic acids along with cyanogenetic glycoside and protein (*Wlth India*, 1959, **5**, 141, CSIR, New Delhi).

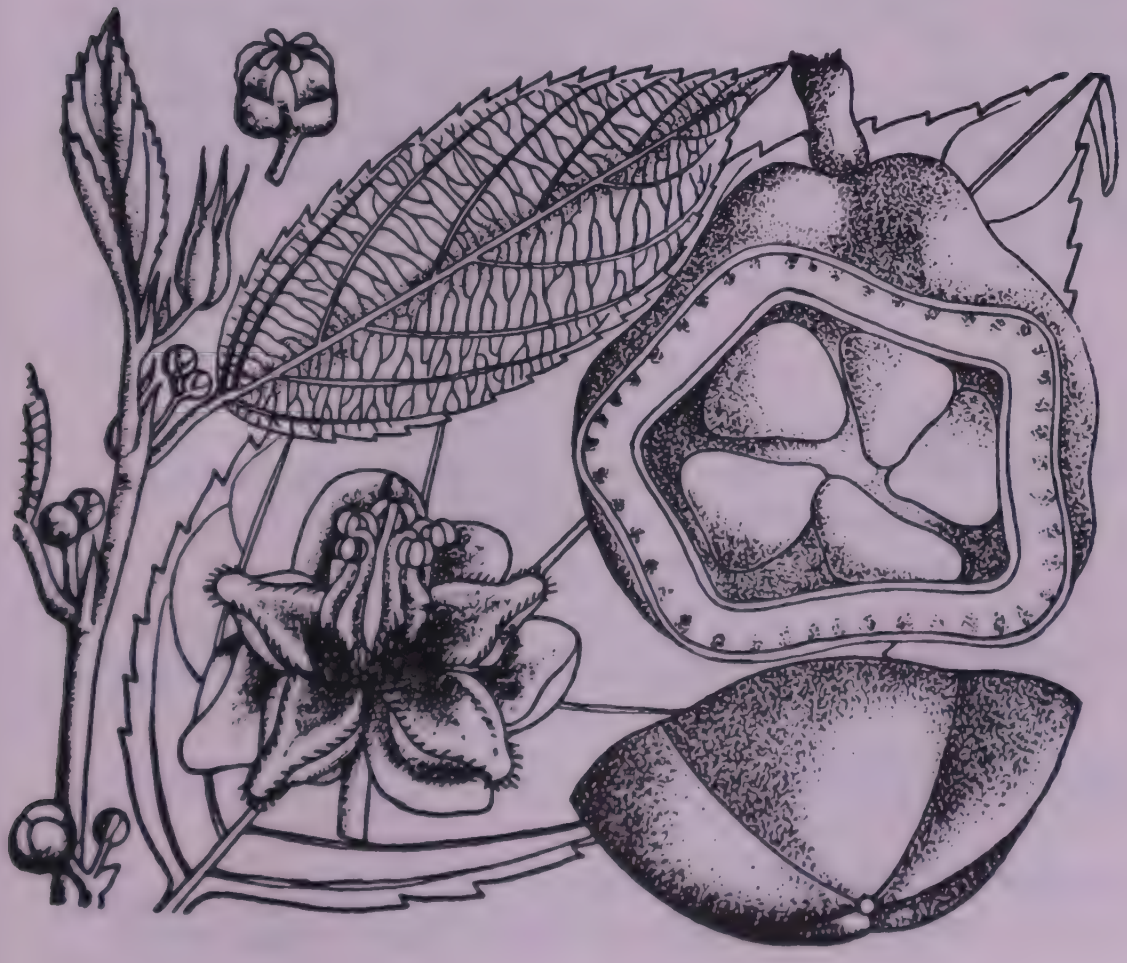
205. *Hydnocarpus laurifolia* (Dennst.) Sleumer
syn. *H. wightiana* Blume; *Munnicksia laurifolia* Dennst.

Vernacular Names : Sans : *Tuvrak*; Hind & Beng : *Chaulmoogra*; Tam : *Maravattai*.

महावीर्यस्तुवरकः कुष्ठमेहापहः परः ।
(सुश्रुत)

mahāvīryastuvaraka: kuṣṭhamēhāpaha: para: .
(suśruta)

It is highly potent against leprosy and polyuria.



Occurrence & Distribution : Common in the tropical forests of Western Ghats from Konkan southwards.

Description : An evergreen dioecious tree, up to 15.2 m or more in height, with fluted stem. Bark rough, brown. Wood whitish, but generally turns brownish-grey due to fungal sap-stain and becomes streaked. Leaf oblong, ovate or elliptic, somewhat serrate, 10.2- 25.4 cm long. Flower small, solitary or borne in fascicles, greenish-white. Fruit globose, mammilate, tomentose, 5.1-10.2 cm diam. Seeds 15-20, striate, subovoid, obtusely angular, 2.0-2.5 cm long.

Flowers in January-May and fruits almost throughout the year.

Part Used : Seeds.

Therapeutic Uses : *Seeds* : oil mainly as remedy for leprosy in early cases (dose, 5 drops gradually increased to 30 drops injected intramuscularly/ intravenously in the form of ethyl esters or salts of chaulmoogric and hydnocarpic acids); mixed with lime-water in sprains in rheumatic joints. *Chaulmoogra ointment* prepared by mixing one part of the oil with 4 parts of vaselin is efficacious in many skin diseasses. Seedss in the form of paste mixed with other ingredients (sulphur, camphor, lime juice and *Jatropha curcus* seed-oil) find external application in wounds and ulcers.

Chemical Constituents : From seeds and seed hulls hydnocarpic, chaulmoogric and its homologues, gorlic, oleic and palmitic acids along with apigenin, luteolin, chrysocrisol, hydnocarpin, isohydnocarpin and methoxyhydnocarpin (flavonolignans) have been reported (*Wlth India*, 1959, **5**, 142, CSIR, New Delhi; *Tetrahedron Lett.*, 1973, 3481; *Indian J. Chem.*, 1974, **12**, 888, 993; *Liebigs Ann.*, 1986, 647).

LII. Violaceae

206. *Hybanthus enneaspermus* (L.) F. Muell. syn. *Ionidium suffruticosum* (L.) R. & S.; *I.enneaspermum* (L.) Vent.; *Viola enneasperma* L.; *V. suffruticosa* L.

Vernacular Names : Sans :***Amburuha;*** Hind : *Ratanpurus*; Beng : *Nunbora*; Tam : *Purusharatnam.*

Occurrence & Distribution : In the warmer parts of India, from Uttar Pradesh southwards to the Deccan Peninsula.

Description : A small diffuse perennial herb, often with woody branches. Leaf opposite, entire or serrate, subsessile, oblanceolate to linear, 3.8-5.1 cm

long. Flowers axillary, solitary, spurred, red or purple. Fruit a small subglobose, capsule. Seed ellipsoid, longitudinally striate, yellowish-white.

Flowers and fruits in October-December.

Parts Used : Whole plant, leaves, stalk and root.

Therapeutic Uses : *Whole plant* : diuretic and tonic; *leaves* and *stalk* (when tender) : demulcent; *root* : in bowel complaints of children.

Chemical Constituents : Leucine, isoleucine, tryptophan and phenylalanine have been reported (*Proc. Indian Acad. Sci. Plant Ser.*, 1986, **96**, 41).

LIII. Guttiferae (Clusiaceae)

207. *Calophyllum inophyllum* L.

Vernacular Names : Sans : *Punnaga*; Hind & Beng : *Sultan champa*; Tam : *Punnagam*; Eng : Alexandrian laurel.

पुन्नागो मधुरः शीतः सुगन्धिः पित्तनाशकृत् ।
(राजनिघण्टु)

punnāgō madhuraḥ śītaḥ sugandhiḥ pittanāśakṛt .
(rājanighaṇṭu)

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
02263
DR435

It is *madhura, sheeta* (*sheetaveerya*); aromatic and subdues deranged *pitta.*

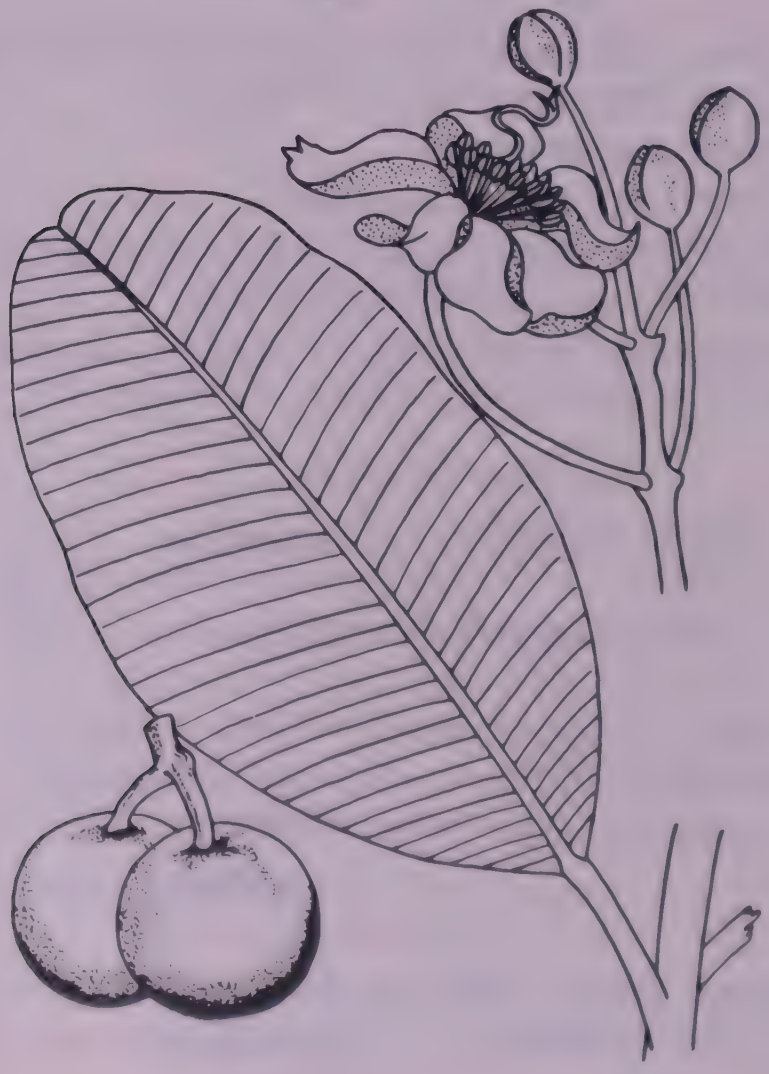
Occurrence & Distribution : On the sea-shores of India, particularly in Maharashtra, Karnataka, Orissa and the Andamans; also cultivated in plains of India.

Description : A moderate-sized evergreen tree, 6.1-7.6 m tall. Bark yields an aromatic yellowish-green resin. Wood reddish-brown to reddish-white. Leaves obovate, elliptic-lanceolate, with many fine parallel veins at right angles, 10.2-20.4 cm long and 7.6- 10.2 cm broad; upper surface deep green, lustrous. Racemes shorter than leaves, borne in upper axils. Flowers white, fragrant, 1.9-2.5 cm diam. Fruit subdrupaceous, rotund, smooth, yellow, 1.3-2.5 cm diam.

Flowers in July-August and fruits in September-October.

Parts Used : Seeds and bark.

Therapeutic Uses : *Seeds* : oil useful for external application in rheumatism and also applied to scabies and other skin diseases; *bark* : astringent, decoction beneficial in internal haemorrhage; *resin* : emetic and purgative.



Chemical Constituents : Friedelin, friedelan-3β-ol, β-amyrin, β-sitosterol, canophyllol, canophyllal, calophyllolide, (+)-inophyllolide, (inophyllum C and its *cis*-isomer E), inophyllum A, B and D, ponnalide, calophyllic, calophynic, canophyllic, isophyllic, inophylloidic, calophenic and inophenic acids, calaustralin, leucocyanidin, calophyllin B, mesuaxanthone B, 1,7-dihydroxy-xanthone, 1,6-dihydroxy-5-methoxyxanthone, 1,5-6-trihydroxyxanthone, 1,7-dihydroxy-3,6-dimethoxyxanthone, guanandin, jacareubin, 6-deoxyjacareubin, 1,3,5,6-tetrahydroxy-2(3-methyl-but-2-enyl)-xanthone, 6-(3-methyl-2-butenyl)-1,5-dihydroxyxanthone, 2-(3-methyl-2-butenyl)-1,3,5-trihydroxyxanthone, amontoflavone, myricetin, myricetin-7-glucoside, quercetin, 4-alkylcoumarin and tannin have been isolated from different parts of the plant (*Curr. Sci.*, 1964, 336; *Ann. Acad. Brazil. Cienc.*, 1968, **40**, 155; *Indian J. Chem.*, 1967, **5**, 523; *ibid.*, 1970, **8**, 105; *J. chem. Soc.*, 1968, 1323; *Tetrahedron Lett.*, 1968, 3285; *ibid.*, 1970, 1999; *Phytochemistry*, 1969, **8**, 927; *ibid.*, 1971, **10**, 603, 1331, 1679; J. chem. Soc., Perkin I, 1972, 1935; *Tetrahedron Lett.*, 1972, 3187; *C.R. Acad. Sci. Ser. C.*, 1972, 275, 1105; *Chem. Abstr.*, 1973, **78**, 58264; *Bull. Inst. chem.*, 1973, **50**, 160; *J. chem. Soc., Perkin I*, 1974, 2510; *Indian J. Chem.*, 1975, **13**, 746; *Phytochemistry*, 1976, **15**, 2016; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1976, **1**, 163, ICMR, New Delhi).

208. *Garcinia mangostana* L.

Vernacular Names : Hind, Beng & Tam : *Mangustan*; Eng : Mangosteen.

Occurrence & Distribution : Cultivated mainly in Madras and on lower slopes of the Nilgiris.

Description : A small or medium-sized tree, 6.1-13.7 m in height. Bark black on outside and yellowish inside. Wood red. Leaves coriaceous, deep green, 15.2-25.4 cm × 6.4-11.4 cm. Flowers solitary, terminal or in pairs, with pink fleshy petals. Fruits borne near the tips of short branches, largely outside the tree, 5.1-6.4 cm diam., globose, slightly flattened at both ends, with a smooth purplish or reddish rind. Seeds 5-8, large, flat, each enclosed in a thick snow-like aril (edible) being sweet with a delicate flavour.

Flowers from November to February and fruits in May-June.

Parts Used : Fruits and bark.

Therapeutic Uses : *Fruits* : rind and pulp or the entire dried fruit as astringent; used in Ayurvedic medicine as specific remedies for chronic diarrhoea and dysentery in children, usually in the form of a syrup; in leucorrhoea, gonorrhoea and gleet.

Chemical Constituents : Gartanin, 8-desoxygartanin, mangostin, normangostin, α, β and γ-mangostins, 3-isomangostin and its hydrate, *l*-isomangostin and

its hydrate, xanthone A, 1,3,6,7-tetrahydroxyxanthone and its O-glycoside, maclurin, 2,4,5-trihydroxy-1-methoxyxanthone, 1,5-dihydroxy-3-methoxy-2-iso-prenylxanthone, 1,7-dihydroxy-3-methoxy-2-iso-prenylxanthone, 6-deoxy-γ)-mangostin, calabaxanthone, demethylcalabaxanthone, 1,5,8-trihydroxy-3-methoxy-2-(3-methyl-but-2-enyl)-xanthone, garcinones A,B,C,D and E, citric acid, sucrose, glucose and fructose (*Wlth India*, 1956, **4**, 103, CSIR, New Delhi; *J. Amer. chem. Soc.*, 1958, **80**, 1691; *Can. J. Chem.*, 1968, **46**, 3770; *Aust. J. Chem.*, 1970, **23**, 2539; *Tetrahedron*, 1971, **27**, 3919; *Indian J. Chem.*, 1971, **9**, 505; *Phytochemistry*, 1975, **14**, 2517; *ibid.*, 1980, **19B**, 1008; *ibid.*, 1981, **20**, 183; *ibid.*, 1982, **21**, 1747; *Indian J. Chem.*, 1986, **25B**, 1157; *ibid.*, 1987, **26B**, 281; *Chem. & Ind.*, 1987, 418; *J. nat. Prod.*, 1987, **50**, 474; *Phytochemistry*, 1988, **27**, 1552).

209. *Garcinia morella* (Gaertn.) Desr.

Vernacular Names : Sans : *Tamala*; Hind & Beng : *Tamal**; Tam : *Makki*; Eng : Indian gamboge tree.

* Though both *G morella* and *G xanthochymus* are known by this name, the latter is more popular as *Tamal*.

तमालः शालवद् वेद्यो दाहविस्फोटहृद् पुनः ।
(भावप्रकाश)

tamālaḥ śālavad vēdyō dāhavisphōṭahṛd punaḥ
(bhāvaprakāśa)

It possesses properties similar to those of *Sala* (*Shorea robusta*); also useful in burning sensation and boils.

Occurrence & Distribution : In the evergreen forests of Assam, Khasi and Jaintia hills, West Bengal and in Western Ghats, up to an altitude of 900 m.

Description : A small or medium-sized evergreen tree, 9.1-15.2 m in height. Wood hard, mottled, yellow. Leaves coriaceous, sagittate or ovate-lanceolate,

10.2-15.2 cm long. Flowers unisexual, sessile, greenish-white, female larger than the male. Fruits globose, 4-lobed, 2-celled, 2 cm diam. Seeds 4, ovoid or reniform, slightly compressed, dark brown.

Flowers and fruits in October-April.

Part Used : Stem-bark.

Therapeutic Uses : *Stem-bark* : the gum resin is a powerful hydragogue, strong purgative for refractory constipation, anthelmintic, useful in amenorrhoea and in ascites; externally applied to relieve pain and swelling. Morellin, an active constituent of *G. morella*, is widely used for promoting wound healing of different etiology.

Chemical Constituents : Morelloflavone, dihydromorelloflavone, morelloflavone-7″- β-glucoside, gambogic acid, morellic acid, isomorellic acid, α-, β-, γ-garcinolic acids, morellin, morellins L, M and T, isomorellin, deoxyisomorellin, dihydroisomorellin, morellinol and guttiferin have been reported (*Wlth India*, 1956, **4**, 105, CSIR, New Delhi; *Tetrahedron Lett.*,1963, 1623; *ibid.*, 1966, 687; *ibid.*, 1967, 3195; *Proc. Indian nat. Sci. Acad.*, 1974, **39**, 365; *Indian J. Chem.*, 1976, **14B**, 19).

210. *Garcinia xanthochymus* Hook. f. & T. And.
syn. *G. tinctoria* Dunn; *G. pictorius* (Roxb.) A. Arcy; *Xanthochymus pictorius* Roxb.; *X. tinctorius* DC.

Vernacular Names : Sans: *Tamala*; Hind & Beng : *Tamal*; Tam : *Tamalam*; Eng : Egg tree.

तमालो मधुरो वल्यो वृष्यश्च शिशिरो गुरुः ।
कफपित्ततृषादाहश्रमभ्रान्तिकरः परः ।।
(राजनिघण्टु)

tamālō madhurō valyō vṛṣyaśca śiśirō guruḥ
kaphapittatṛṣādāhaśramabhrāntikaraḥ paraḥ ..
(rājanighaṇṭu)

It is *madhura*, invigorating, aphrodisiac, *shishira* (sheetaveerya) and *guru*; beneficial in deranged *kapha*, *pitta*; allays thirst, burning sensation and fatigue; causes vertigo.

Occurrence & Distribution : In the lower hill forests of eastern Himalayas, West Bengal, Western Ghats, Nilgiris and the Andamans up to 1,200 m.

193. *Carica papaya* L.

197. *Shorea robusta* Gaertn.f.

198. *Dillenia indica* L.

214. *Corchorus olitorius* L.

218. *Abelmoschus esculentus* (L.) Moench

220. *Abutilon indicum* (L.)Sw.

222. *Gossypium herbaceum* L.

224. *Hibiscus rosa-sinensis* L.

Description : A medium-sized bushy evergreen tree, with a straight bole and spreading angular branches arising in tiers. Leaves coriaceous, bright green, 25.4-38.1 cm × 3.8-15.2 cm. Flowers axillary, thick, rough, white. Fruits globular, smooth, with a conspicuous beak somewhat on one side, 5.1-6.4 cm diam., yellow when ripe. Seeds 1-4, oblong.

Flowers during spring and fruits in summer.

Parts Used : Fruits, seeds and bark.

Therapeutic Uses : *Fruits* : juice made into a syrup is a cooling drink in biliousness; *seeds* : oil antiscorbutic and a potent remedy for dysentery and diarrhoea; *bark* : astringent, useful in dysentery.

Chemical Constituents : Xanthochymol, isoxanthochymol, maclurin, euxanthone, 1,5-dihydroxy- and 1,3,5-trihydroxy-xanthones, 1,2-dihydroxy-5-methoxyxanthone, 1,5-dihydroxy-2-methoxyxanthone and 1,5-dihydroxy-3-methoxyxanthone, cambogin, volkensiflavone (talbataflavone), morello-flavone, biflavones GB-1 and GB-1a,1,7-dihydroxanthone have been isolated (*Tetrahedron Lett.*, 1970, 4203; *ibid.*, 1973, 4977; *ibid.*, 1976, 2921; *Chem. Ind.*, 1979, 92; *Curr. Sci.*, 1979, **48**, 814; *Indian J. Chem.*, 1980, **19B**, 627).

211. *Mammea suriga* (Buch.-Ham. ex Roxb.) Kost.
syn. *Mammea longifolia* Planch. ex Triana; *Ochrocarpus longifolius* Benth. & Hook. f.

Vernacular Names : Sans : *Nagakesar*; Hind & Beng : *Nagkesar*; Tam : *Nagappu*.

Occurrence & Distribution : In the evergreen forests of the Western Ghats of the Konkan, Malabar and Coimbatore up to an altitude of 600 m.

Description : A large tree with a cylindrical trunk, 12-18 m in height and 1.8 m in girth. Leaves thickly coriaceous, broadly ovate, greenish; midrib hard. Flowers borne in dense fascicles, sweet-scented, white or pinkish, globose in bud. Fruits obliquely ovoid, 1-4 seeds, 2.5 cm long.

Flowers from January to March and fruits afterwards.

Part Used : Flowers.

Therapeutic Uses : *Flowers* and *dried buds* : astringent, bitter, stomachic and stimulant; beneficial in diarrhoea, used in haemorroids and dyspepsia.

Chemical Constituents : Stearyl stearate, stilbene, squalene, β-sitosterol, campesterol, stigmasterol, cycloartenol, vitexin and meso-inositol have been isolated from the flowers and buds. Leaves contain friedelin, amentoflavone, mono- and di-O-methyl-amentoflavones, 3,4,5-trihydroxybenzoic acid, quercetin-3-glucoside and vitexin. Two alkylated coumarins, surangin A and surangin B, and taraxerol occur in the roots (*Labdev J. Sci. Technol.*, 1966, **4**, 159; *Tetrahedron*, 1969, **25**, 1453; *Indian J. Chem.*, 1973, **11**, 840; *ibid.*, 1974, **12**, 226; *Lloydia*, 1975, **38**, 346; *Curr. Sci.*, 1978, **47**, 414; *Indian J. Chem.*, 1983, **22B**, 609).

212. *Mesua ferrea* L.

Vernacular Names : Sans : *Nagakeshara**; Hind & Beng : *Naageswar*; Tam : *Nangu*; Eng : Iron-wood.

नागकेशरात्पोष्णं लघु तिक्तं कफापहम् ।
वस्तिवातामयघ्नं च कण्ठशीर्षरुजापहम् ॥
(राजनिघण्टु)

nāgakēśarālpōṣṇaṃ laghu tiktaṃ kaphāpaham .
vastivātāmayaghnaṃ ca kaṇṭhaśīrṣarujāpaham ..
(rājanighaṇṭu)

It is mild *ushna*, *laghu*, *tikta*; súbdues deranged *kapha*; cures diseases of urinary bladder and those caused by deranged *vata*; beneficial in sore throat and headache.

Occurrence & Distribution : Found in the eastern Himalayas, Assam, West Bengal, Eastern and Western Ghats as well as the Andamans ascending to an elevation of 1,500 m.

Description : A medium-sized or large evergreen tree with short trunk, often buttressed at the base. Leaf coriaceous, lanceolate, 5.1-15.2 cm × 3.8-4.5 cm, usually covered with a waxy bloom below, red when young. Flowers large, solitary or in clusters of 2-3, fragrant, white. Fruit ovoid, nearly woody, 2.5-5.0 cm long, with persistent calyx. Seeds 1-4, dark brown; cotyledons oily, fleshy.

Flowers from February to April and fruits in September.

Parts Used : Fruits, seeds, flowers, leaves and bark.

Therapeutic Uses : *Fruits* : astringent, useful in gastric troubles; *seeds* : oil in rheumatism and cutaneous affections; *flowers* : astringent, stomachic and expectorant; powder mixed with *ghee* (butter fat) applied externally in bleeding piles; buds useful in dysentery; *leaves* : as poultice applied on forehead in severe colds; *bark* : astringent, decoction combined with ginger used as sudorific.

Chemical Constituents : Mesuol (5,7-dihydroxy-8-isopentenyl-6-isobutyryl-4-{phenylcoumarin), mesuone, mammeigin, mesuagin, mammeisin, α- and β-amyrins, β-sitosterol, mesuaferrones A and B, mesuanic acid, euxanthone,

* Though *Mamea longifolia* and some other plants are used under the same name, *Mesua ferrea* appears to be the genuine *Nagakeshara*.

mesuaxanthones A and B, ferruols A and B, guttiferol, oleic, stearic, palmitic and linoleic acids, 1,5-dihydroxyxanthone, 1,7-dihydroxyxanthone, 1-hydroxy-7-methoxyxanthone, 1,5-dihydroxy-3-methoxyxanthone, gentisin, 1,5,6-trihydroxyxanthone and ferrxanthone have been encountered. The presence of acetaldehyde, *n*-hexaldehyde and glyoxal in the seed oil has been reported (*Phytochemistry*, 1968, **7**, 1871; *ibid.*, 1984, **23**, 1816; *Medicinal Plants of India*, ed. G.V. Satyavati *et al*, 1987, **2**, 243, ICMR, New Delhi).

LIV. Tiliaceae

213. *Corchorus capsularis* L.

Vernacular Names : Sans : *Kalashaka*; Hind & Beng : *Titapat*; Eng : White jute.

कालशाकं सरं रुच्यं वातकृत् कफशोथहृत् ।
वल्यं रुचिकरं मेध्यं रक्तपित्तहरं हिमम् ॥

(भावप्रकाश)

kālaśākaṃ saraṃ rucyaṃ vātakṛt kaphaśōthahṛt .
valyaṃ rucikaraṃ mēdhyaṃ raktapittaharaṃ himam ..
(bhāvapı akāśa)

It is *sara* and appetizing; aggravates *vata*; pacifies deranged *kapha*; cures oedema; invigorating; removes anorexia; brain tonic; helpful in haemorrhagic diseases; *hima* (*sheetaveerya*).

Occurrence & Distribution : Cultivated in Assam, West Bengal, Orissa, Bihar and Uttar Pradesh.

Description : An annual herb, with slender stems. Leaves simple, ovate-lanceolate to oblong, with stellate hairs, and a rounded or subcordate base. Flowers 1-3 together, axillary, small, yellow. Capsule 0.8-1 cm across, deeply grooved longitudinally, coarsely warty to cross-plicate. Seeds 0.3-0.32 × 0.1 cm.

Flowers during July-August and fruits in October.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : purgative; *leaves* : demulcent, laxative, carminative, bitter tonic; useful in fever, dysentery, dyspepsia and liver disorders.

Chemical Constituents : Two biosides, olitoriside and erysimoside, and a trioside of strophanthidin with boivinose, strophanthidin, corchoroside A, B and C, helveticoside, oligosaccharides, ursolic acid and corosin have been isolated (*J. chem. Soc.*, 1950, 2198; *J. Indian chem. Soc.*, 1951, **28**, 167; *Glossary of Indian Medicinal Plants*, ed. R.N.Chopra *et al*, 1956, 76; *ibid.*, (Suppl.) 1969, 19, CSIR, New Delhi; *Indian J. Pharm.*, 1970, **32**, 17; *ibid.*, 1971, **33**, 58; *Helv. chem. Acta.*, 1971, **54**, 1960; *Pakist J. sci. industr. Res.*, 1971, **14**, 49; *Chem. Abstr.*, 1971, **75**, 106046; *Z. Naturforsch.*, 1974, **29C**, 209; *Chem. Abstr.*, 1974, **81**, 74854; *Z. Naturforsch.*, 1979, **34B**, 1326; *Phytochemistry*, 1984, **23**, 2583; *J. nat. Prod.*, 1987, **50**, 479).

214. *Corchorus olitorius* L.

Vernacular Names : Sans : *Pattasaka*; Hind : *Koshta*; Beng : *Mitha-pat*; Tam : *Peratti*; Eng : Tossa jute.

पट्टशाकस्तु नाड़ीको नाड़ीशाकश्च सः स्मृतः ।
नाड़ीको रक्तपित्तघ्नो विष्टम्भी वातकोपनः ॥
(भावप्रकाश)

paṭṭaśākastu nāḍīkō nāḍīśākaśca saḥ smṛtaḥ .
nāḍīkō raktapittaghnō viṣṭambhī vātakōpanaḥ ..
(bhāvaprakāśa)

Pattasaka and *nadika* are identical. It cures haemorrhagic diseases; flatulent and aggravates *vata*.

Occurrence & Distribution : Cultivated in many parts of India, also grows wild.

Description : An annual herb, with slender stems. Leaves simple, ovate-oblong to lanceolate, with stellate hairs and without basal bristle-like lobes. Flower 1 or 2 together, axillary or leaf-opposed, small, yellow. Capsule glabrous, up to 6-7 cm long, longitudinally grooved with purplish streaks along the grooves, beaked.

Flowers during July-August and fruits in September.

Parts Used : Seeds and leaves.

Therapeutic Uses : *Seeds* : purgative; *leaves* : demulcent, diuretic, infusion as febrifuge; tonic; useful in chronic cystitis and dysuria.

Chemical Constituents : Erysimoside, olitoriside, olitorin, helveticoside, strophanthidin, strophanthidol, trioside of strophanthidin, corchorosides A and B, coroloside, deglucocoroloside, corosolic acid, ursolic acid, corosin and oxocorosin (*Glossary of Indian Medicinal Plants*, ed. R.N. Chopra, *et al*, 1956, 77; *ibid.*, (Suppl.), 1969, 19, CSIR, New Delhi; *Indian J. Pharm.*, 1972, **34**, 168; *Khim. Prir. Soedin*, 1975, 525; *Chem. Abstr.*, 1975, **83**, 203758; *Z. Naturforsh.*, 1979, **34B**, 1326).

215. *Elaeocarpus sphaericus* (Gaertn.) K. Schum.
syn. *E. ganitrus* Roxb.; *Ganitrus sphaericus* Gaertn.

Vernacular Names : Sans, Beng & Tam : *Rudraksha*; Hind : *Rudraki*; Eng : Ultrasum-bead tree.

रुद्राक्षमम्लमुष्णञ्चवातघ्नं कफनाशनम् ।
शिरोर्त्तिशमनं रुच्यं भूतग्रहविनाशनम् ॥
(राजनिघण्टु)

rudrākṣamamlamuṣṇañcavātaghnaṃ kaphanāśanam .
śirōrttiśamanaṃ rucyaṃ bhūtagrahavināśanam ..
(rājanighaṇṭu)

It is *amla*, *ushna*; pacifies demaged *vata* and *kapha*; relieves headache; appetizing and beneficial in mental diseases.

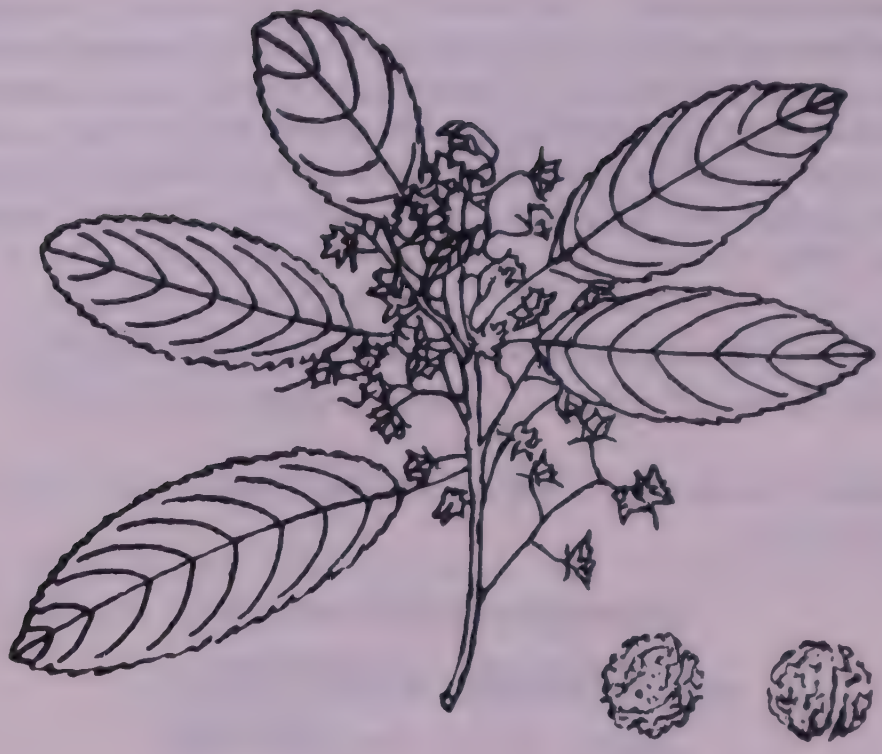
Occurrence & Distribution : Found in the North-eastern region, West Bengal, Bihar, Madhya Pradesh and Maharashtra.

Description : A large-tree. Leaves simple, subentire, nearly glabrous, oblong-lanceolate. Flowers borne in axillary racemes, white. Stamens many; anthers bearded, one anther-cell acute, longer than the other. Drupe obovoid, or globose, deep or bluish-purple, enclosig a hard tubercled longitudinally grooved, normally 5-celled stone.

Flowers in April-June and fruits in October-December.

Part Used : Fruits.

Therapeutic Uses : *Fruits* : In the treatment of headache and epileptic fits. Powdered fruits (0.5 gm) mixed with warm water are given (two/three times daily) in asthma.



Chemical Constituents : Fruits contain palmitic, isopalmitic, linoleic and myristic acids. From leaves the alkaloids : (–)-alloelaeocarpiline, elaeocarpidine, *dl*-elaeocarpine, (+)-epialloelaeocarpiline, (–)-epielaeocarpiline, (+)-epiisoelaeocarpiline, (–)-isoelaeocarpiline, *dl*-isoelaeocarpiline, (+)-pseudoepiisoelaeocarpiline are reported (*Aust. J. Chem.*, 1971, **24**, 1679; *The Alkaloids*, ed. R.H.F. Manske, Academic Press, London, 1973, **14**, 326; *J. Indian. chem. Soc.*, 1976, **53**, 531; *Planta med.*, 1977, **32**, 197; *J. Amer. chem. Soc.*, 1979, **101**, 7114; *Phytochemistry*, 1979, **18**, 700; *J. Indian chem. Soc.*, 1981, 823).

216. *Grewia subinaequalis* DC.
syn. *G. asiatica* L.; *G. hainesiana* Hole

Vernacular Names : Sans : *Parusha*; Hind & Beng : *Phalsa*; Tam : *Palisa*.

परूषमम्लं कटुकं कफार्त्तिजित्
वातापहं तत् फलमेव पित्तदम् ।
सोष्णं च पक्वं मधुरं रुचिप्रदं
पित्तापहं शोफहरञ्च तर्पणम् ॥
(राजनिघण्टु)

parūṣamamlaṃ kaṭukaṃ kaphārttijit
vātāpahaṃ tat phalamēva pittadam .
sōṣṇaṃ ca pakvaṃ madhuraṃ rucipradaṃ
pittāpahaṃ śōphaharañca tarpaṇam ..
(rājanighaṇṭu)

It is *amla*, *katu*; subdues deranged *kapha*, *vata* and pain; unripe fruits aggravate *pitta* and *ushna*. Ripe fruits are *madhura*, palatable and appetizing; subdues deranged *pitta* and cures oedema.

Occurrence & Distribution : Cultivated throughout India for its edible fruits.

Description : A small tree or large straggling shrub. Bark rough, grey. Leaves broadly cordate to ovate with oblique base, irregularly serrate; stipules lanceolate. Flowers borne in axillary clusters, yellow. Drupe subturbinate, indistinctly lobed, purple or red, 1-2 seeded.

Flowers during March-April or July-August and fruits about a month later.

Parts Used : Fruits, leaves and root-bark.

Therapeutic Uses : *Fruits* : astringent, cooling and stomachic; infusion of bark is demulcent; *leaves* : applied externally to pustular eruptions; *root-bark* : in rheumatism.

Chemical Constituents : Lupeol, lupenone, betulin, friedelin, taraxasterol, β-amyrin, 3, 21, 24-trimethyl-5,7-dihydroxy-hentriacontanoic acid δ-lactone, grewinol, pelargonidin-3,5-diglucoside, 3-glucosides of delphinidin and cyanidin, quercetin and its glucoside, naringenin-7-O-β-D-glucoside, kaempferol and amino acids are reported (*J. Indian chem. Soc.*, 1975, **52**, 553; *Lloydia*, 1976, **39**, 372; *Phytochemistry*, 1976, **15**, 1397; *J. Indian chem. Soc.*, 1979, **56**, 649; *J. Fd. Sci. Technol.*, 1981, **15**, 10; *Chem. Abstr.*, 1981, **95**, 58111; *J. Sci. Res.*, 1982, **4**, 55; *Chem. Abstr.*, 1982, **97**, 159519).

217. *Triumfetta rhomboidea* Jacq. syn. *T. bartramia* L.

Vernacular Names : Sans : *Jhinjharita*; Hind : *Chikti*; Beng : *Banokra*; Tam *Ottupullu*; Eng : Burweed.

झिन्झिरीटा कटुः शीता कषाया चातिसारजित् ।
वृष्या सन्तर्पणी वल्या महिषीक्षीरवर्द्धिनी ॥
(राजनिघण्टु)

jhinjhirīṭā kaṭuḥ śītā kaṣāyā cātisārajit .
vṛṣyā santarpaṇī valyā mahiṣīkṣīravarddhinī ..
(rājanighaṇṭu)

It is katu, *sheeta* (*sheetaveerya*), *kashaya*, antidiarrhoeal, aphrodisiac, palatable and invigorating; increases secretion of buffalo's milk.

Occurrence & Distribution : Throughout tropical and sub-tropical India, up to an elevation of 1,200 m in the Himalayas.

Description : A perennial herb, up to 1.5 m tall. Leaves cordate, rhomboid or ovate, irregularly serrate, usually 3-lobed. Flowers borne in dense cymes, small, bright yellow, 1.9 cm diam Fruits ovoid or globose, with smooth hooked spines.

Flowers and fruits from October to December-January.

Parts Used : Fruits, flowers, leaves, bark and root.

Therapeutic Uses : *Fruits, flowers* and *leaves* : promote parturition when it is delayed; demulcent and astringent; *leaves* and *bark* : used in diarrhoea and dysentery; *root* : diuretic; a hot infusion is given to facilitate child birth.

Chemical Constituents : 4-Hydroxyisoxazole and triumboidin (*Tetrahedron Lett.*, 1981, 3451; *Fitoterapia*, 1981, **52**, 285; *Phytochemistry*, 1986, **25**, 768).

LV. Malvaceae

218. *Abelmoschus esculentus* (L.) Moench
syn. *Hibiscus esculentus* L.

Vernacular Names : Sans: *Dindish*; Hind : *Bhindi*; Beng : *Dheras*; Tam : *Vendai*; Eng : Lady's finger.

डिण्डिशो रुचिकृद् भेदी पित्तश्लेष्मापहः स्मृतः ।
शिशिरो वातलो रूक्षो मूत्रलश्चाश्मरीहरः ॥
(भावप्रकाश)

ḍiṇḍiśō rucikṛd bhēdī pittaślēṣmāpaha: smṛta: .
śiśirō vātalō rukṣō mūtralaścāśmarihara: ..
(bhāvaprakāśa)

Lady's finger is appetizing, laxative; subdues deranged *pitta* and *sleshma*; *shishira* (*sheetaveerya*), aggravates *vata*, *ruksha*, diuretic and beneficial in urinary calculii.

Occurrence & Distribution : Cultivated throughout India up to an altitude of 1,200 m.

Description : An annual erect herb, 0.9-1.2 m in height, covered with hairs. Leaves palmately 3-5 lobed, coarsely toothed, cordate. Flowers large, yellow with crimson centre. Fruit 7-angled elongated conical capsule, hairy or smooth; green or creamy green. Seeds many, hairy, rotund, striate.

Flowers and fruits in June-December.

Parts Used : Fruits and seeds.

Therapeutic Uses : *Fruits* : nutritious, demulcent, emollient, diuretic; a mucilaginous preparation used as a plasma replacement; decoction of immature capsules as anodyne, demulcent, diuretic, anticatarrhal and useful in dysentery, ardor urinae, dysuria and gonorrhoea; *seeds* : stimulant, antispasmodic; infusion of roasted seeds sudorific.

Chemical Constituents : The pods contain carotene, folic acid, thiamine, riboflavin, niacin, vitamin C, oxalic acid and the essential amino acids. The mucilage of the fruit on hydrolysis affords glucose, glucosamine and amino acids. Controlled hydrolysis yields two oligosaccharides, 4-O-D-galacto-pyranosyl-D-galactose and 2-O-(D-galactopyranosyluronic acid)-L-rhamnose. The seeds afford protein, lipids, gossypol, thiamine, riboflavin, niacin and α-tocopherol. Seed oil yields myristic, palmitic, stearic, palmitoleic, oleic, linolenic and linoleic acids, glycerides, in addition to 12,13-epoxyoleic and 9-hexadecenoic acids and tocopherols. The flowers contain mono-, di- and tri-glucosides of quercetin, quercetin-5-rhamnoglucoside, gossypetin-8-glucoside, gossypetin-8-rhamnoglucoside, gossypetin-3-glucoside-8-rhamnoglucoside and 3,5,3′, 4′, 5′-pentahydroxy-7-methoxyflavonol in addition to two anthocyanins, cyanidin 4′-glucoside and cyanidin 3-glucoside- 4′-glucoside (*Wlth India*, 1985, **1A**, 7, CSIR, New Delhi).

219. *Abelmoschus moschatus* Medic.
syn. *Hibiscus abelmoschus* L.

Vernacular Names : Sans : *Latakasturika*; Hind & Beng : *Mushkdana*; Tam : *Kattukasturi*; Eng : Musk mallow.

तताकस्तुरिका तिक्त स्वाद्वी वृष्या हिमा लघुः ।
चक्षुष्या छेदिनी श्लेष्मतृष्णावस्त्यास्य-रोगहृत् ॥

(भावप्रकाश)

latākasturikā tiktā svādvī vṛṣyā himā laghuḥ .
cakṣuṣyā chēdinī ślēṣmatṛṣṇāvastyāsya-rōgahṛt ..
(bhāvaprakāśa)

It is *tikta*, *svadu* (*madhura*), aphrodisiac, *hima* (*sheetaveerya*), *laghu*; efficacious in ophthalmia, expectorant, subdues *sleshma*, allays thirst, cures diseases of urinary bladder and stomatitis.

Occurrence & Distribution : Found wild all over the Deccan in the hilly regions as well as the Himalayan foot hills; cultivated in Maharashtra and Uttar Pradesh.

Description : An annual or biennial hirsute erect herb, 0.6-1.8 m in height. Leaves polymorphous : upper palmately 3-7 lobed; lower acute, ovate. Flowers usually borne in solitary, axillary, sometimes in few flowered racemes, bright yellow, 5.1-7.6 cm. Capsules hispid, acute, ovate, 6.5-7.5 cm long. Seeds many, sub-reniform, curved, musk-scented, black.

Flowers and fruits from June-January.

Parts Used : Seeds, leaves and root.

Therapeutic Uses : *Seeds* : aphrodisiac, antispasmodic, carminative, demulcent, diuretic, stomachic and tonic; used as an inhalation in hoarseness and dryness of the throat; rubbed to a paste with milk known to cure scabies; infusion or decoction useful in nervous disorders and in hysteria; *leaves* and *root* : efficacious in gonorrhoea and venereal diseases.

Chemical Constituents : Leaves, flowers and seeds of the plant contain β-sitosterol and its glucoside, campesterol, stigmasterol, cholesterol, ergosterol, higher fatty acids, esters of acetic and ambrettolic acids, ambrettolide (musk-like odour), farnesol, farensylacetate, furfural, linoleic acid, α-cephalin, phosphatidylserine and its plasmalogen, phosphatidylcholine plasmalogen, myricetin and its glucoside, cannabiscitrin, cyanidin-3-sambubioside and cyanidin-3-glucoside (*Proc. nat. Acad. Sci.*, 1984, **54B**, 236; *With India*, 1985, **1A**, 12, CSIR, New Delhi; *Phytochemistry*, 1986, **25**, 2157).

220. *Abutilon indicum* (L.) Sw.

syn. *A. asiaticum* (L.) Sw.; *Sida guineensis* Schumach.

Vernacular Names : Sans : *Atibala*; Hind : *Kanghi*; Beng : *Petari*; Tam : *Perum tutti*; Eng : Country mallow.

तिक्ता कटुश्चातिवला वातघ्नी क्रिमिनाशिनी ।
दाह तृष्णा विषच्छर्दि कफ्लेदोपशमनी परा ।।
(राजनिघण्टु)

tiktā kaṭuścātivalā vātaghnī krimināśinī .
dāha tṛṣṇā viṣacchadirda kalēdōpaśamanī parā ..
(rājanighaṇṭu)

Country mallow is *tikta*, *katu*; subdues deranged *vata*; anthelmintic; cures burning sensation, allays thirst; antidotal, antiemetic and anti-fatigue.

Occurrence & Distribution : Found as a weed in the sub-Himalayan tract and hills up to 1,200 m and in hotter parts of India.

Description : A perennial, softly tomentose shrub, up to 3 m in height. Stems round, frequently tinged with purple. Leaves ovate to orbicular-cordate, 1.9-2.5 cm long. Flowers solitary on jointed peduncles, orange-yellow or yellow. Capsules hispid, hardly larger than the calyx, awns erect. Seeds 3-5, reniform, tubercled or minutely stellate-hairy, black or dark brown.

Flowers and fruits almost throughout the year.

Parts Used : Seeds, leaves, bark and root.

Therapeutic Uses : *Seeds* : in piles; laxative, expectorant; in chronic cystitis, gleet and gonorrhoea; *leaves* : demulcent, locally applied to boils and ulcers and as a fomentation to painful parts of the body; decoction used in toothache and tender gums; given internally for inflammation of bladder; infusion of *leaves* or *root* : demulcent and diuretic; prescribed in fever, chest affection, and urethritis; *bark* : astringent and diuretic.

Chemical Constituents : The plant contains hexoses, *n*-alkane mixtures (C_{22-34}), alkanols, β-sitosterol, vanillic, *p*-coumaric, caffeic, fumaric, *p*-hydroxybenzoic, *p*- β-D-glycosyloxybenzoic, galacturonic and amino acids. The petals yield cyanidin-3-rutinoside, gossypetin-8- and 7-glucosides. Seed-oil affords palmitic, stearic, oleic, linoleic and linolenic acids (*Wlth India*, 1985, **1A**, 20, CSIR, New Delhi).

221. *Abutilon theophrastii* Medic syn. *A. avicennae* Gaertn.

Vernacular Names : Sans & Beng : *Jaya*; Eng : Indian mallow.

Occurrence & Distribution : In Bihar, Orissa, Andhra Pradesh, Maharashtra, Gujarat, Punjab and Kashmir up to an altitude of 1,500 m.

Description : An annual softly tomentose herb, attaining a height up to 3.6 m. Leaves nearly entire, long-petioled, serrate, orbicular-cordate with a long point. Flowers solitary, axillary, yellow. Capsules with 15-20 carpels, larger than the calyx segment, oblong, hispid, each with two long horizontally spreading awns. Seeds pilose.

Flowers during March-April and fruits during July.

Parts Used : Seeds, leaves and root.

Therapeutic Uses : *Seeds* : laxative, demulcent and useful in coryza; decoction given in dysentery, fistula and eye sore; *leaves* : demulcent; juice antipyretic; decoction applied in toothache; both leaves and seeds are valued in the treatment of gonorrhoea and urinary diseases; *root* : decoction efficacious in cutaneous affections.

Chemical Constituents : Seed-oil has the following fatty acids : palmitic, stearic, oleic and linoleic. Mucilage from root contians pentoses, methylpentoses, hexoses, pentosans, methylpentosans and uronic acids. Rutin is present in the

leaves (*J. pharm. Soc., Japan*, 1956, **76**, 347; *Chem. Abstr.*, 1956, 9688; *With India*, 1985, **1A**, 22, CSIR, New Delhi).

222. *Gossypium herbaceum* L. *syn. G. obtusifolium* Roxb. (in part); *G. wightianum* Tod.

Vernacular Names : Sans : *Karpashi*; Hind : *Rui*; Beng : *Tula*; Tam : *Paratti*; Eng : Levant cotton.

कार्पासी मधुरा शीता स्तन्या पित्तकफापहा ।
तृष्णादाहश्रमभ्रान्तिमूर्च्छाहृत् वलकारिणी ॥
(राजनिघण्टु)

kārpāsī madhurā śītā stanyā pittakaphāpahā .
tṛṣṇādāhaśramabhrāntimūrcchāhṛt valakāriṇī ..
(rājanighaṇṭu)

Cotton plant is *madhura*, *sheeta* (*sheetaveerya*), galactogogue, efficacious in deranged *pitta* and *kapha*; allays thirst; alleviates burning sensation and fatigue; beneficial in vertigo and syncope; invigorating.

Occurrence & Distribution : Throughout India.

Description : A small shrub, 0.61-2.44 m tall. Stems thick and rigid but twigs and young leaves sparsely hairy. Leaves flat, with 3-7 lobes; lobes ovate-rotund, slightly constricted at base. Flowers medium-sized, yellow with purple centre, rarely white. Capsules beaked, with smooth surface and very few oil-glands, rounded, opening slightly when ripe. Seeds generally with two coats of hairs : lint hairs grey, red-brown or white and fuzz hairs almost of the same colour and distributed uniformly.

Flowers and fruits almost throughout the year.

Parts Used : Seeds, leaves, root and root-bark.

Therapeutic Uses : *Seeds* : demulcent, mild laxative, galactagogue, abortifacient, aphrodisiac, nervine tonic and useful in headache; *leaves* : juice antidysenteric; decoction finds special application in fever and diarrhoea; *root* : diuretic; pasted with dehusked rice-water given in leucorrhoea; *root-bark* : emmenagogue and galactagogue.

Chemical Constituents : Gossypol, gossyfulvin, gossypurpurin, gossycaerulin, gossypin, gossypetin, gossypitrin, herbacitrin, herbacetin, leucodelphinidin, betaine, quercetin, isoquercetin, quercimeritrin, phytosterols,

phytosteroline, carotenoids, vitamin E, methyl and higher alcohols, furfural, phenol, formic, salicylic, dihydroxybenzoic and caproic acids, vanillin, azulene, raffinose, pentosans, proteoses, peptones and phospholipids (*J. Amer. chem. Soc.*, 1917, 777; *ibid.*, 1920, 1197; *ibid.*, 1925, 1751; *ibid.*, 1926, 2721; *Proc. Indian Acad. Sci.*, 1934-35, **1A**, 887; *ibid.*, 1935, **2A**, 494; *ibid.*, 1936, **4A**, 54; *ibid.*, 1937, **5A**, 357; *ibid.*, 1939, **9A**, 177, 365; *ibid.*, 1971, **37A**, 411; *J. Sci. industr. Res.*, 1947, **6** (Suppl.) 64; *ibid.*, 1957, **16A**, 319; *Chemurg. Dig.*, 1948, **7**, 9; *Oils oilseeds J.*, 1953-54, **6**, 12; *J. chem. Soc. chem. Comm.*, 1985, 1573).

223. *Hibiscus cannabinus* L.

Vernacular Names : Sans : *Nalita*; Hind : *Ambari*; Beng : *Mestapat*; Tam : *Pulichhai*; Eng : Mesta.

Occurrence & Distribution : Assam, West Bengal, Bihar, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Uttar Pradesh and Punjab.

Description : An erect, annual herb with straight, slender, glabrous or prickly stem, 2.4-3.6 m high. Upper leaves palmate, deeply 5-7 lobed and lower cordate; lobes denticulate, sinuous, oblong-lanceolate. Flowers axillary, yellow with

crimson centre, 7.6-10.2 cm diam. Capsules bristly, pointed, globose. Seeds brown, nearly glabrous, large.

Flowers during autumn as well as winter and fruits during summer.

Parts Used : Flowers, seeds and leaves.

Therapeutic Uses : *Flowers* : juice mixed with sugar and black pepper used as a popular remedy for constipation and gastritis; *seeds* : aphrodisiac; externally applied as anodyne; *leaves* : purgative.

Chemical Constituents : Cannabinidin, cannabisectin, cannabiscitrin, delphinidin-3-β-D-glucoside (myrtillin) and its β-D-xyloside (cannabinin), myricetin-3′-α-D-glucoside isolated from flowers. Linoleic, oleic, palmitic and stearic acids are present in seeds. Leaves contain fructose, glucose, mannose, sucrose; *n*-tetra- to *n*-nona cosanes; *n*-tria-, tetra-, henta-, *n*-hentria-, dotria-, to heptatriacontanes; hexa- and octa-cosanols, tria- and dotria-contanols, cyclohexanol; cerotic, lignoceric, melissic, montanic, protocatechuic and vanillic acids; isoquercitrin, rutin; α-amyrin, kaempferol-3, 7-O-α-L-dirhamnofuranoside and β-sitosterol, (−)-epicatechol and its gallate, kaempferol-3-β-L-rhamnopyranoside-7-α-L-rhamnoside and proanthocyanidin have been

encountered in the roots (*Curr. Sci.*, 1938, 504; *Wlth India*, 1959, **5**, 77, CSIR, New Delhi; *Z. Naturforsch.*, 1964, **19**, 857; *Chem. Abstr.*, 1964, **61**, 15041; *Khim. Prir. Soedin*, 1970, **6**, 129; *Chem. Abstr.*, 1970, **73**, 106301; *Khim. Prir. Soedin*, 1971, **7**, 723; *Chem. Abstr.*, 1972, **76**, 124169; *Indian J. Chem.*, 1975, **13**, 535; *Egypt. J. Chem.*, 1976, **19**, 633; *Chem. Abstr.*, 1979, **91**, 120353; *Khim. Prir. Seodin*, 1976, **12**, 257, 388; *Chem. Abstr.*, 1976, **85**, 59602, 106650; *Khim. Prir. Soedin*, 1979, **15**, 97, 219, 233; *Chem. Abstr.*, 1979, **91**, 52705, 171667, 171685).

224. *Hibiscus rosa-sinensis* L.

Vernacular Names : Sans : *Japa*; Hind : *Jasum*; Beng : *Jaba*; Tam : *Semparuti*; Eng : Chinese hibiscus.

जपा संग्राहिणी केश्या त्रिसन्ध्या कफवातजित् ।
(भावप्रकाश)

japā saṅgrāhiṇī kēśyā trisandhyā kaphavātajit .
(bhāvaprakāśa)

It is astringent, promotes hair growth; both white and red flowers or *trisandhya* varieties subdue deranged *kapha* and *vata*.

Occurrence & Distribution : Cultivated as an ornamental plant in gardens throughout India and often planted as a fence or hedge-plant.

Description : An evergreen woody glabrous showy shrub, 1.5-2.4 m in height. Leaves coarsely toothed above, entire below, ovate, bright-green. Flowers axillary, solitary, campanulate, red, blue, yellow or white, 10.2-15.2 cm diam. Capsules (rare) rotund, many-seeded.

Flowers almost throughout the year.

Parts Used : Flowers, leaves and root.

Therapeutic Uses : *Flowers* : refrigerant, emollient and emmenagogue, aprhodisiac; decoction given in bronchial catarrh; infusion of *petals* is a refrigerant drink in fever, demulcent in cough and useful in strangury, cystitis and other genito-urinary troubles; oil from the fresh petals and olive oil in equal proprotion find application in alopecia; *buds* : in seminal weakness; *leaves* : anodyne, emollient and aperient; juice beneficial in gonorrhoea, alopecia and also used for blackening hair; *root* : in cough.

Chemical Constituents : Taraxeryl acetate, β- sitosterol, hentriacontane, sterculic and malvalic acids, quercetin and its glucosides, cyanidin glucosides, cyanin and cyanidin chlorides, kaemperol-3-xylosylglucoside, thiamine, riboflavin, niacin, ascorbic acid, carotene, methyl-10-oxo-11- octadecynoate, methyl-8-oxo-9-octadecynoate, methyl-9-methylene- 8-oxoheptadecanoate and methyl-10-methylene-9-oxooctadecanoate (*Phytochemistry*, 1972, **11**, 1518; *J. Amer. Oil. chem. Soc.*, 1976, **53**, 607; *Phytochemistry*, 1986, **25**, 449; *Medicinal Plants of India*, ed. G.V. Satyavati *et al.*, 1987, **2**, 29, ICMR, New Delhi).

225. *Pavonia odorata* Willd.

Vernacular Names : Sans : *Valak*; Hind & Beng : *Sugandhabala*; Tam : *Peramutti.*

वालकं शीतलं तिक्तं पित्तवान्तितृषापहम् ।
ज्वरकुष्ठातिसारघ्नं केश्यं श्वित्रव्रणप्रणुत् ॥
(राजनिघण्टु)

vālakaṃ śītalaṃ tiktaṃ pittavāntitṛṣāpaham .
jvarakuṣṭhātisāraghnaṃ kēśyaṃ śvitravraṇapraṇut ..
(rājanighaṇṭu)

It is *sheeta* (*sheetaveerya*), *tikta*; acts against deranged *pitta*, antiemetic; allays thirst, cures fever, dermatisis, diarrhoea; promotes hair-growth; useful in leucoderma and ulcers.

Occurrence & Distribution : Found in waste places and open woods in the Deccan, Madhya Pradesh, Rajasthan, Uttar Pradesh, Orissa and West Bengal.

Description : A pubescent herb, with root having a musk-like odour. Leaves cordate-ovate, shallowly 3-5 lobed, dentate or lower ones entire, 3.8-12.7 cm. Flowers axillary, fragrant, pink or white. Fruits 2-chambered, each chamber containing a single seed. Seeds oily, brown.

Flowers and fruits during October-January.

Part Used : Root.

Therapeutic Uses : *Root* : astringent, antipyretic, demulcent, stomachic, diaphroetic and diuretic; bruised well with *ghee* (butter fat) applied to erysipelas as poultice; paste with dehusked rice-water acts as an antiemetic.

Chemical Constituents : Isovaleric acid, isovaleraldehyde, aromandendrene, pavonene, α-terpenene, azulene and pavonenol are reported (*J. inst. chem. India*, 1961, **33**, 229; *Wlth India*, 1966, **7**, 283, CSIR, New Delhi).

226. *Sida cordifolia* L.

Vernacular Names : Sans : *Vala*; Hind : *Kungyi*; Beng : *Brela*; Tam : *Nilatutti*; Eng : Country mallow*.

वलातितिक्ता मधुरा पित्तातिसारनाशनी ।
वलवीर्यप्रदा-पुष्टिकफरोगविशोधनी ।।
(राजनिघण्टु)

valātitiktā madhurā pittātisāranāśanī .
valavīryapradā-puṣṭikapharōgaviśōdhanī ..
(rājanighaṇṭu)

It is extremely bitter (*ati-tikta*), *madhura*; beneficial in deranged *pitta*, cures diarrhoea; invigorating, spermatopoietic and nutritive; efficacious in diseases caused by deranged *kapha*.

* *Abutilon indicum* is also known by the same name

Occurrence & Distribution : Grows wild along the roadsides, throughout sub-tropical and tropical India, ascending up to 1,050 m.

Description : A small downy erect herb or shrub, 1.5 m in height, with long branches, sometimes rooting at nodes. Leaves cordate, oblong, ovate or ovate-oblong, very downy on both surfaces; petiole as long as the blade. Flowers small, tawny-yellow or white, carpels 10. Fruits with a pair of awns on each carpel.

Flowers and fruits from rainy season to winter.

Parts Used : Whole-plant, seeds, leaves and root.

Therapeutic Uses : In Ayurvedic system, *S. cordifolia* is considered as one of the most important medicinal herbs and finds various applications; either alone or in combination. The more important uses are :

Whole plant : juice mixed with water beneficial in spermatorrhoea; *seeds* : aphrodisiac; useful in colic, tenesmus and gonorrhoea; *leaves* (infusion) : febrifuge; *root* : astringent, diuretic and tonic; infusion useful in nervous and urinary diseases, cystitis, strangury, bleeding piles, haematuria, chronic dysentery, leucorrhoea, gonorrhoea and in asthma as cardiac tonic; juice for

healing wounds; powder mixed with milk given in leucorrhoea and in frequent micturition; decoction in combination with ginger cures intermittent fever; oil prepared from the decoction of root mixed with milk and sesame oil finds application in nervous diseases.

Chemical Constituents : Ephedrine, ψ-ephedrine, S-(+)-N_b-methyltryptophan methylester, hypaphorine, vasicinone, vascicine, vasicinol, choline, betaine, phytosterol and resin acids from the plant and proteins, linoleic, malvalic and sterculic acids have been reported from the seeds (*Wlth India*, 1972, **9**, 322, CSIR, New Delhi; *Phytochemistry*, 1975, **14**, 830; *J. Amer. Oil Chem. Soc.*, 1984, **61**, 1345; *Curr. Sci.*, 1985, **54**, 690).

227. *Sida rhombifolia* L.
(a). var. *rhombifolia*

Vernacular Names : Sans : *Mahasamanga*; Hind : *Atibala*; Beng : *Pit-berela*; Tam : *Athibala chedi*; Eng : Broomjute sida.

महासमंगा मधुरा अम्ला चैव त्रिदोषहा ।
युक्ता वुधैः प्रयोक्तव्या ज्वरदाहविनाशनी ।।
(राजनिघण्टु)

mahāsamaṅgā madhurā amlā caiva tridōṣahā .
yuktā vudhaiḥ prayōktavyā jvaradāhavināśanī ..
(rājanighaṇṭu)

It is *madhura, amla*; pacifies deranged *tridosha*. With judicious combinaiton with other ingredients the specialist may use it in the treatment of fever and burning sensation.

(b). var. *rhomboidea* (Roxb.) Mast.

Vernacular Names : Sans : *Mahabala*; Hind : *Safed-beriala*; Beng : *Swet-berela*.

महावला तु हृदरोग वातार्शः शोफन्नाशनी ।
शुक्रवृद्धिकरी वल्या विषमज्वरहारिणी ।
(राजनिघण्टु)

mahāvalā tu hṛdarōga vātārśaḥ śōphanāśanī .
śukravṛddhikarī valyā viṣamajvarahāriṇī .
(rājanighaṇṭu)

It is beneficial in heart disease, deranged *vata*, piles, oedema; spermatopoietic, invigorating and antimalarial.

Occurrence & Distribution : Throughout India particularly in moist regions ascending up to 1,800 m in the Himalayas. However, the var. *rhomboidea* is rare and appears to be native to West Bengal.

Description : An erect, annual or perennial undershrub, 1.5 m in height. Leaves highly variable; lanceolate to rhomboid-acute (rhomboid-obtuse, sub-acute in var. *rhomboidea*), sub-glabrous above and hoary or grey-pubescent beneath. Flowers small, axillary, solitary or in pairs, yellow or rarely white (white in var. *rhomboidea*). Fruits small, with a pair of awns on each carpel. Seeds 1-2, smooth, black.

Var. *rhombifolia* flowers during rainy season and fruits later while var. *rhomboidea* blossoms and fruits during winter.

Parts Used : Whole plant, leaves, stem and root.

Therapeutic Uses : *Plant* : in pulmonary tuberculosis and rheumatism; *leaves* : applied to swelling as paste; *stem* : mucilage, both for external and internal use, as demulcent and emollient; *root*; in the treatment of rheumatism; paste with milk on oral administration (with honey) relieves pain of leucorrhoea.

Chemical Constituents : Ephedrine, cellulose and lignin, quinazolines, β-phenethylamines, tryptamine derivative, sterculic, malvalic, linoleic acids are reported (*J. Sci. industr. Res.*, 1956, **15B**, 672; *Bull. bot. Soc. Bengal*, 1968, **22**, 76; *Indian J. exp. Biol.*, 1968, **6**, 232; *J. Amer. Oil Chem. Soc.*, 1976, **53**, 698; *ibid.*, 1984, **61**, 1345, *Planta med.*, 1981, **43**, 384).

228. *Sida alba* L. syn. *S. spinosa* L.

Vernacular Names : Sans : *Nagbala*; Hind : *Janglimethi*; Beng : *Bon-methi*; Tam : *Arivalmanaippundu*; Eng : Prickly sida.

मधुराम्ला नागवला कषायोष्णो गुरुः स्मृता ।
कण्डूति कुष्ठवातघ्नीव्रणपित्तविकारजित् ॥
(राजनिघण्टु)

madhurāmlā nāgavalā kaṣāyōṣṇō guruḥ smṛtā .
kaṇḍūti kuṣṭhavātaghnīvraṇapittavikārajit ..
(rājanighaṇṭu)

It is *madhura, amla, kashaya, ushna* and *guru*; beneficial in pruritus and other dermatosis, ulcer, deranged *vata* and *pitta*.

Occurrence & Distribution : Throughout the hotter parts of India, ascending to an altitude of 1,350 m.

Description : A small erect, perennial, shrub, often with spiny tubercles below the vriable leaves, covered with minute stellate hairs. Leaves linear-lanceolate, elliptic, obovate or ovate, 5.1 cm long, base cordate or cuneate. Flowers axillary, solitary, fascicled on short shoots, yellow or white, carpels 5. Seeds 5-9, blackish-brown.

Flowers and fruits from September to December.

Parts Used : Leaves and root.

Therapeutic Uses : *Leaves* : demulcent, refrigerant and useful in gonorrhoea and scalding urine; efficacious in the treatment of worms; *root* : diaphoretic,

tonic; used in mild cases of debility and fever; decoction (also of root-bark) soothing effect in irritability of the bladder and in gonorrhoea; ethanolic extract hypoglycaemic.

Chemical Constituents : Quinazoline, β- phenethylamines and tryptamine derivatives are reported (*Planta med.*, 1981, **43**, 384).

229. *Sida cordata* (Burm. f.) Borssum
syn. *S. veronicaefolia* Lam.; *S. humilis* Cav.

Vernacular Names : Sans : *Bhumibala*; Hind : *Bhiunli; Beng : Junka*; Tam : *Palampasi.*

Occurrence & Distribution : Throughout India, ascending up to 1,500 m.

Description : A somewhat hairy herb, frequently procumbent and sometimes rooting at nodes. Leaves cordate, ovate, sparingly hispid. Flowers axillary, solitary, or borne in pairs or in small cymes, yellow. Seeds brown.

Flowers and fruits throughout the year.

Parts Used : Fruits, flowers, leaves and root-bark.

Therapeutic Uses : *Fruits* and *flowers* : along with sugar used for burning sensation in micturition; *leaves* : juice efficacious in diarrhoea during pregnancy; poultice applied to cuts and bruises; *root-bark* : in leucorrhoea, micturition and gonorrhoea.

Chemical Constituents : It contains β-phenethylamines, quinazoline, carboxylated tryptamine, linoleic acid, malvalic acid, sterculic acid and gossypol (*Planta med.*, 1981, **43**, 384; *J. Amer. Oil chem. Soc.*, 1984, **61**, 345; *J. agric. Fd. Chem.*, 1990, **38**, 505; *Chem. Abstr.*, 1990, **112**, 115731).

230. *Thespesia populnea* Soland. ex Corr.

Vernacular Names : Sans : *Parisha*; Hind & Beng : *Paras-pipal*; Tam : *Poovarasam;* Eng : Indian tulip tree.

पारीशो दुर्ज्जरः स्निग्धः क्रिमिशुक्रकफप्रदः ।
फलेम्लो मधुरो मूत्रे कषायः स्वादुमज्जकः ॥
(द्रव्यगुण)

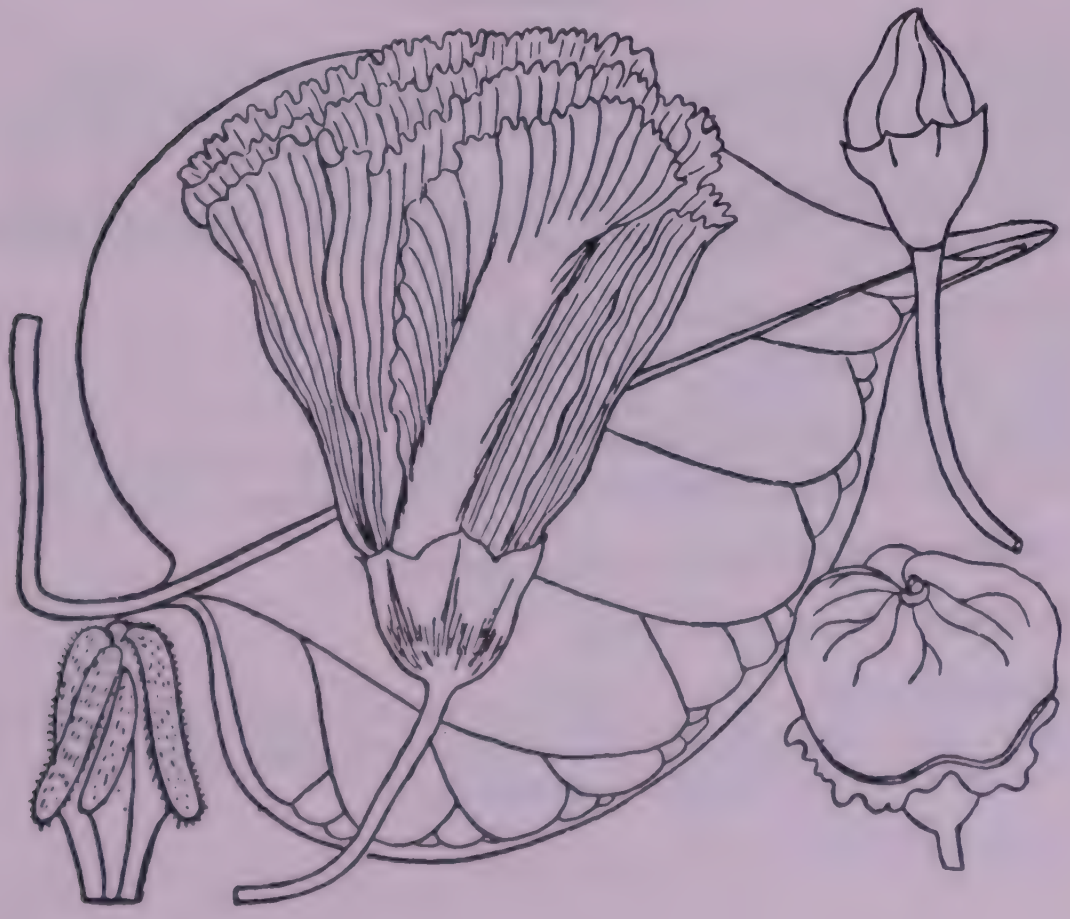
pārīṣō durjjaraḥ snigdhaḥ krimiśukrakaphapradaḥ .
phalēmlō madhurō mūlē kaṣāyaḥ svādumajjakaḥ ..
(dravyaguṇa)

It is difficult to digest; *snigdha*; produces worms; excites kapha; spermatopoietic. Fruits *amla*, *madhura*; roots *kashaya*; pulp *madhura*.

Occurrence & Distribution : A common strand plant, extending from the shores of West Bengal to Peninsular India and the Andamans. Also grown as a road-side tree in tropical regions.

Description : A compact quick-growing evergreen tree, 18 m in height and 1.2 m in girth. Bark often knobby, fibrous, fissured, grey to brown. Leaves cordate-ovate, dark-green, covered with rusty scales, 7-15 cm long. Flowers showy, large. Corolla sulphur-yellow or pale-yellow with a large deep purple spot at the base, fading to pinkish-red. Capsules brown, oblong or globose, 2.5 cm × 4.0 cm, with persistent calyx. Seeds flat, elliptic, powdery or pilose on the surface.

Flowers and fruits from rainy season to winter.



Parts Used : Fruits, flowers, leaves, bark and root.

Therapeutic Uses : *Fruits, flowers* and *leaves* : for external applications to scabies, psoriasis and other skin diseases; *leaves* : in the form of hot poultice beneficial in painful joints; *bark* : astringent; decoction; employed as alterative; *root* : tonic.

Chemical Constituents : The plant yields kaempferol and its glycosides, herbacetin and its glucoside, populneol, populnin, populnetin, quercetin, rutin, gossipetin, (+)-gossypol, β-sitosterol and its glucoside, lupeol, lupenone, alkanes, myricylalcohol, calycopterin, sesquiterpenoidal quinones, *viz.*, thespeson, thespone, mansonones C,D,E and F, amino acids and carbohydrates. Fatty acid composition of the seed oil is also reported (*J. Sci. industr. Res.*, 1955, **14B**, 93; *Glossary of Indian Medicinal Plants*, ed. R.N. Chopra *et al*, 1956, 243; *ibid.* (Suppl.), 1969, 96; CSIR, New Delhi; *Indian J. Chem.*, 1963, **1**, 451; *Econ. Bot.*, 1967, **21**, 128; *Curr. Sci.*, 1968, **37**, 135; *Tetrahedron Lett.*, 1968, 261; *Indian J. Chem.*, 1971, **9**, 286; *ibid.*, 1972, **10**, 263; *ibid.*, 1973, **11**, 506; *Curr. Sci.*, 1973, **42**, 821; *ibid.*, 1975, **44**, 109, 888; *Indian J. Chem.*, 1983, **22B**, 95; *Pakist. J. Bot.*, 1985, **17**, 49; *Chem. Abstr.*, 1986, **104**, 31780; *Bangladesh J. Sci. industr. Res.*, 1987, **22**, 8; *Chem. Abstr.*, 1989, **110**, 72517; *Acta Ciene Indica Chem.*, 1989, **15**, 117; *Chem. Abstr.*, 1990, **112**, 155297).

231. *Urena lobata* L.

Vernacular Names : Sans : *Vana-bhenda*; Hind : *Bachita*; Beng : *Ban okra**; Tam : *Ottatti*.

Occurrence & Distribution : Throughout the tropical regions of India as a weed in waste places, forest-clearings and road-sides.

Description : A variable undershrub, up to 2.4 m in height. Leaves variable, angled or shallowly lobed, roundish or ovate, 5.1-7.6 cm long. Flowers borne in axillary clusters or sometimes forming leafless terminal racemes, bright pink. Capsules indehiscent, densely pubescent, echinate, armed with stellately-barbed bristles. Seeds smooth, rounded on the back and wedge-shaped on the innerside.

Flowers during rainy season and fruits during winter.

Parts Used : Flowers, stem and root.

Therapeutic Uses : *Flowers* : expectorant; infusion used in sore throat and aphthosis; *stem* : decoction used in cases of flatulent colic; *root* : diuretic; as external embrocation in rheumatism and lumbago.

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* *Triumfetta rhomboidea* is also known by the same name.

Chemical Constituents : Seeds contain protein, pentosan and mucilage. Mangiferin and quercetin have been isolated from the aerial parts. Alkanes, stigmasterol and β-sitosterol are reported from the whole plant (*Sci. & Cult.*, 1975, **41**, 336; *Arogya* (*Manipal, India*), 1981, **7**, 140; *Chem. Abstr.*, 1982, **96**, 24699; *Hua Hsueh*, 1983, **41**, 72; *Chem. Abstr.*, 1984, **101**, 107402).

GLOSSARY OF SANSKRIT/AYURVEDIC TERMS

ādhmāana	epistasis/flatulence
agnirohiṇī	plague
āksepasamana	anticonvulsant
āmadoṣa	indigestion and impaired metabolism
āmamāruta/āmavāta	rheumatoid arthritis
ānāha	epistasis/flatulence
apacī	adenitis
arocakahara	that which cures anorexia
arśah	piles; haemorrhoid
aśmarī	urinary calculi
asradoṣa	dyscrasia
asraghna/asranut	that cures dyscrasia
asrapitta	haemorrhagic disease
asṛk	blood
atisāra	diarrhoea
aupasargikameha	gonorrhoea
avidāhī	digestive
bhagnasandhānakṛt	which promotes union of fractures
bhedana	cathartic
bhrama	vertigo
bhūtagraha	mental disease
bhūtarakṣākara	that cures psychic disorders
chardi	vomiting; emesis
chedinī	expectorant
dīpanī	gastric stimulant
dīpanapācana	gastric stimulant and digestant
dūrjara	that which is difficult to digest
durnāma	piles; haemorrhoid
duṣṭakauṭilyanāśana	that cures psychic disorder
gada	disease
galagaṇḍahārī	that which cures goitre
gaṇḍamālā	scrofula
gara	poison

garbhapātinī	abortifacient
garbhasaṁsthāpana	that which prevents abortion
garbhāśayaviśodhinī	which improves the function of uterus
gaulya/madhura	sweet
grahaṇī	sprue
grāhī	astringent, that which binds the bowel
gudabhramsa	prolapsed rectum
gu'ma	abdominal lump
hṛdyam	cardio-tonic
indralupta	alopecia
jīrṇajurtinut	which cures pyrexia of unknown origin
kāmalā	jaundice
kaṇḍu	pruritus
kaṇṭhaśuddhikaram	which removes hoarseness of voice
kledahara	that which removes fatigue
lekhana	act of scraping; which reduces body-weight
lūtā	insect
mada	syncope
meha	urinary disease
moha	delusion
mukhajādyahara	which cures dysarthia
mukharoga	stomatitis
mukhaśoṣa	xerostomia
mūrchā	syncope
mūtrakṛcchra	urinary trouble; dysuria
mūtrala	diuretic
palitastambhinī	which prevents ageing
pāmā	scabies
pāṇḍu	anaemia
pathya	diet
pīnasa	nasal catarrh
pliha	thrombophlebitis
premeha	spleen
pravāhikā	polyuria
rajodoṣaprasamanī	dysentery
	that which cures dysmenorrhea

rakṣohara	which cures mental disorders
raktadoṣa	dyscrasia
raktagranthirujāpaha	which cures adenitis
raktapitta	haemorrhagic disease
raktavāta	dyscrasia
rasāyana	rejuvenating
rechanī	purgative; laxative
rochana	appetizing
rucya	appetizer
santāpa	burning sensation
santarpaṇī	palatable
sidhma	nettlerash
siphā	root
śirodoṣārtikṛntanah	that which cures headache
śiraṣavāta	headache
śītapitta	urticaria
śoṇitasrutihṛt	styptic
śopha/śotha	oedema
śoṣa	emaciation
stanya	that which increases breast milk
stīnadīptida	that which induces lasting grace / helps to maintain the graceful appearance
śukrameha	spermatorrhoea
śūla	colic; acute spasmodic pain
svādu/madhura	sweet
śvāsa	bronchial asthma/dyspnea
śvetapradara	leucorrhoea
śvitra	leucoderma
tuvara/kasaya	astringent
tvachya	that which keeps the skin healthy and soft
udāvarta	constipation
vahnimāndya	dyspepsia
vaktraruk	stomatitis
vaktṛvaiśadyajananī	which removes fetid
valāsa	consumption
valya	tonic; invigorating

vānti	vomiting
varṇya	which brightens complexion
vasti	bladder
vātalam	that which aggravates *vata*, the malfunction of which develops diseases
vātāmaya	diseases caused by deranged *vāta*
vāta rakta	gout
vidradhi	internal abscess
vikṛta	septic
viṣamajvara	malaria
visarpa	erysipelas
viśoṣanāśana	anticachectic
visphoṭaka	boil
viṣṭambhī	flatulence
viṭsanga	constipation
vivandha	flatulence
vraṇa	ulcer
vṛmhana	which promotes bulk of the body
vṛṣya	aphrodisiac; promoting virility
yakṛddālyudara	hepatomegaly
yonidoṣa	disease of female genital organ/ gynaecological disorder
yonivyāpada-vināśanī	curative of gynaecological disorder

GLOSSARY OF MEDICAL TERMS

Abortifacient	An agent that causes abortion
Abrasion	Removal of the epidermis of skin or mucous membrane
Abscess	A localised collection of pus in a tissue
Acne vulgaris	An eruption of papules and pustules on an inflammatory base
Adenitis	Inflammation of a gland
Alopecia	Baldness; loss of hair
Amenorrhea	Absence or abnormal cessation of menses
Analgesic	Relieves pain
Anasaraca	Accumulation of fluid in subcutaneous connective tissues
Anodyne	Capable of relieving pain
Anorexia	Loss of appetite; aversion to food
Anthelmintic	Destroys or expels intestinal worms
Antidote	Counteracts poison
Antiemetic	Prevents or arrests vomiting
Antihaemorrhagic	Arrests profuse bleeding
Antiphlogistic	Preventing or relieving inflammation
Antipyretic	Reduces fever
Antitussive	Relieving cough; a cough remedy
Aperient	Mild purgative
Aphrodisiac	Arousing sexual desire
Aphthous	Relating to minute ulcer on mucous membrane with grey or white exudate
Ascites	Abnormal accumulation of serous fluid in peritoneal cavity
Atonic	Without normal tone or tension

Balanitis	Inflammation of the glans-penis
Bruise	A large, blotchy, superficial discolouration of the skin due to hematoma without rupture
Bubos	Inflammatory swelling of one or more lymph-glands in the groin
Carbuncle	Deep-seated infection of several contiguous hair follicles with formation of connecting sinuses and resulting in ulceration and formation of pus
Carminative	Relieving flatulence
Catarrh	Inflammation of mucous membrane with profuse discharge
Cathartic	Strong purgative
Cephalalgia	Headache
Cholagogue	Stimulates gall bladder contraction and promotes the flow of bile into the intestine
Colic	Spasmodic pain in the abdomen
Coma	A state of unconsciousness from which the patient cannot be roused even by powerful stimuli
Conjunctivitis	Inflammation of the mucous membrane covering the anterior surface of the eye-ball
Contraceptive	An agent for the prevention of conception
Contusion	Bruise without rupture of blood vessels
Convulsion	Violent spasm
Coryza	Inflammation of the nasal mucous membrane with profuse discharge from the nose
Cystitis	Inflammation of the bladder, specially urinary bladder
Demulcent	Soothing
Dentition	Appearance of the teeth exterior to the surface of dental arch

Deobstruant	An agent that removes obstruction to secretion or excretion
Dermatosis	Skin lesion
Diaphoretic	Promotes sweating
Diuretic	Promotes the flow of urine
Dyscrasia	An abnormal or pathologic condition of blood
Dysmenorrhoea	Painful menstruation
Dyspepsia	Indigestion
Dyspnoea	Respiratory troubles
Dysuria	Difficulty and pain in urination
Elephantitis	Inflammation of fibrous tissue caused by filarial worms
Emaciation	Growing lean
Emetic	An agent that causes vomiting
Emmenagogue	Promotes menstrual flow
Emollient	Softens the skin and soothes irritation of the skin and mucous membrane
Enteritis	Inflammation of intestine
Erysipelas	A febrile disease characterised by inflammation and redness of skin or mucous membrane
Euphoria	A subjectively pleasant feeling of well-being
Expectorant	Increases bronchial secretion and facilitates its expulsion
Fatigue	A state of diminished capacity to respond effectively to stimulus reducing the efficiency of accomplishment
Febrifuge	A remedy for fever
Fibroid	Composed of fibres or fibrous tissue
Flatulence	Excessive formation of gases in stomach and intestine

Galactagogue	An agent that promotes the secretion and flow of milk
Gastralgia	Stomach-ache
Gibbous	Hump or hunch
Goitre	Chronic enlargement of the thyroid gland
Haemophilia	An inherited defect in coagulating power of the blood
Haemoptysis	Spitting of blood from the lungs or bronchial tubes
Haemostasis	Arrest of bleeding
Hemicrania	Pain on one side of the head
Hemorrhoid	Piles with painful swellings at the anus
Hydrophobia	Fear of water caused by rabies
Hyperglycemia	An abnormally high concentration of glucose in blood
Hypertrophy	Overgrowth
Impetigo	Scabby eruption commonly occurring on the face caused by *Staphylococci* or *Streptococci*
Indolent	Painless
Insomnia	Inability to sleep
Intoxication	State of being drunk
Lactagogue	Which promotes the secretion and flow of milk
Lochia	Discharge from the reproductive tract occurring after child birth
Leucoderma	Depigmentation of the skin
Lithiasis	Formation of calculi, especially the biliary or urinary ones
Lumbago	Pain in mid and lower back
Menorrhagia	Excessive or prolonged menstruation
Narcotic	Producing stupor associated with the relief of pain

Neuralgia	Nerve pain
Nyctalopia	Night blindness
Onychia	Inflammation of the nail-bed
Ophthalmia	Inflammation of the eye
Otalgia	Ear-ache
Parturition	Giving birth to a child
Prolapse	Descending of an organ from normal position
Prurigo	A chronic skin disease marked by eruption of papules with intense itching
Pruritus	Itching
Puerperal	Post-natal period
Purulent	Pus forming
Putrid	Rotten
Pyemia	The presence of pus cells in the blood stream
Refrigerant	Cooling effect
Rubefacient	Reddening of the skin
Scorbutic	Relating to scurvy
Scrofula	Tuberculosis with glandular swelling
Spasmolytic	Which relieves spasm
Spermatorrhoea	Involuntary discharge of semen
Stomachic	A gastric stimulant
Stomatitis	Inflammation of the mucous membrane of the mouth
Strangury	Slow and painful discharge of urine
Sudorific	An agent causing sweating
Suppuration	Formation of pus
Syncope	Swoon
Tenesmus	Painful spasm of the anal sphincter with an urgent desire to evacuate bowel or bladder
Ulcer	A wound with superficial loss of tissue

Urethritis	Inflammation of urethra
Urinary calculi	Stone in bladder
Urticaria	An eruption of the skin marked by transient appearance of slightly elevated reddish patches associated with severe itching
Vaginitis	Inflammation of vagina
Vertigo	Dizziness
Vesicant	Producing blisters
Xerostomia	Dryness of mouth

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(198)	Dillenia	(E)	140
(218)	Dindish	(S)	171
(149)	Dulal labha	(B)	68
(149)	Duralambha	(S)	68
	E		
(144)	East Indian wal-nut	(E)	61
(210)	Egg tree	(E)	156
(181)	Egyptian rattlepod	(E)	119
(145)	Elephant creeper	(E)	62
	F		
(185)	Fenugreek	(E)	125
(124)	Fever nut	(E)	27
(152)	Flame of the forest	(E)	73
	G		
(138)	Gandha babul	(H)	49
(165)	Garikalai	(B)	94
(195)	Garjan	(H & B)	136
(145)	Gila	(H & B)	62
(117)	Golap	(B)	15
(169)	Grass pea	(E)	98
(150)	Groundnut	(E)	70
(117)	Gulab	(H)	15
(126)	Gulutora	(H)	30
(148)	Gundu-mani	(T)	66
(148)	Gunja	(S)	66
(195)	Gurjun	(E)	136
(138)	Guye babul	(B)	49
	H		
(113)	Hemsagar	(H & B)	8
(116)	Himalayan wild cherry	(E)	13
(162)	Horse gram	(E)	90
	I		
(175)	Indian beech	(E)	110
(163)	Indian butter bean	(E)	91
(164)	Indian coral tree	(E)	92
(209)	Indian gam-boge tree	(E)	154
(139)	Indian gum arabic tree	(E)	51
(168)	Indian indigo	(E)	98

Plant No.			Page
(178)	Indian kino tree	(E)	115
(131)	Indian laburnum	(E)	41
(221)	Indian mallow	(E)	175
(130)	Indian senna	(E)	35
(230)	Indian tulip tree	(E)	188
(212)	Iron-wood	(E)	163
(120)	Iruvaji	(T)	22
	J		
(224)	Jaba	(B)	180
(141)	Jalbarburaka	(S)	54
(176)	Jand	(H)	112
(228)	Janglimethi	(H)	186
(224)	Japa	(S)	180
(190)	Japhara	(T)	131
(166)	Jashtimadhu	(B)	95
(224)	Jasum	(H)	180
(149)	Jawasa	(H)	68
(221)	Jaya	(S & B)	175
(181)	Jayanti	(S, H & B)	119
(166)	Jethi-madh	(H)	95
(158)	Jhanjhana	(B)	81
(192)	Jhau	(H & B)	133
(158)	Jhunjhunia	(H)	81
(192)	Jhavuka	(S)	133
(217)	Jhinjharita	(S)	170
(229)	Junka	(B)	187
	K		
(177)	Kaarboka arisi	(T)	114
(120)	Kachnar	(H & B)	22
(155)	Kadalai	(T)	77
(199)	Kadichai	(T)	141
(138)	Kadivel	(T)	49
(156)	Kakkanan	(T)	79
(213)	Kalashaka	(S)	164
(164)	Kaliyana murukku	(T)	92
(130)	Kalyani	(S)	35
(122)	Kanchanara	(S & H)	24
(220)	Kanghi	(H)	174
(201)	Kanju	(H)	144
(172)	Kapikacchu	(S)	102
(137)	Karangalli	(T)	48
(175)	Karanja	(S, H & B)	110
(222)	Karpashi	(S)	177
(139)	Karuvelei	(T)	51
(133)	Kasamarda	(S)	43
(133)	Kasaunda	(H)	43
(132)	Kasondi	(H)	42
(124)	Kat-karanja	(H)	27
(184)	Kattualandu	(T)	124
(219)	Kattukasturi	(T)	172
(201)	Katukala	(T)	144
(124)	Kazhichikay	(T)	27
(137)	Khadira	(S)	48
(118)	Khairwal	(H)	16
(137)	Khayer	(H & B)	48
(169)	Khesari	(H & B)	98
(172)	Kiwach	(H)	102

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(140)	Kodil	(T)	52
(153)	Kodi murukkam	(T)	75
(202)	Kodumundi	(T)	145
(182)	Kolingi	(T)	121
(162)	Kollu	(T)	90
(202)	Kondai	(H)	145
(131)	Konnei	(T)	41
(214)	Koshta	(H)	166
(118)	Kovidara	(S)	16
(119)	Kovidara	(S)	21
(126)	Krishnachura	(B)	30
(143)	Krishnasirish	(S & B)	56
(146)	Kuchikanta	(B)	64
(162)	Kulattha	(S)	90
(162)	Kulthi	(H)	90
(148)	Kunch	(B)	66
(142)	Kunchandana	(S)	55
(197)	Kungiliyam	(T)	139
(226)	Kungyi	(H)	182
(162)	Kurti-kalai	(B)	90
(203)	Kusthapa	(S)	146
(201)	Kutukala	(T)	144

L

(218)	Lady's finger	(E)	171
(147)	Lajjabati	(B)	65
(147)	Lajjalu	(S)	65
(147)	Lajwanti	(H)	65
(191)	Lal-jhau	(H & B)	132
(190)	Latkan	(H & B)	131
(219)	Latakasturika	(S)	172
(153)	Latapalasha	(S & B)	75
(170)	Lentil	(E)	100
(222)	Levant cotton	(E)	177
(166)	Licorice	(E)	95

M

(201)	Madagaskar plum	(E)	144
(163)	Madhusarkara	(S)	91
(227)	Mahabala	(S)	184
(228)	Mahabala	(S)	186
(227)	Mahasamanga	(S)	184
(163)	Makhan-sim	(B)	91
(209)	Makki	(T)	154
(194)	Makrisal	(B)	135
(113)	Malakalli	(T)	8
(121)	Maljan	(H)	23
(164)	Mandara	(H)	92
(118)	Mandari	(T)	16
(208)	Mangosteen	(E)	153
(208)	Mangustan	(H, B &T)	153
(128)	Manulaippal-virai	(T)	33
(205)	Maravattai	(T)	149
(188)	Masha	(S)	12
(184)	Mashani	(B)	124
(184)	Mashaparni	(S & H)	124
(188)	Mash-kalai	(B)	129

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(170)	Masura	(S, H & B)	100
(174)	Matar	(S, H & B)	109
(126)	Mayikonnai	(T)	30
(223)	Mesta	(E)	178
(223)	Mestapat	(B)	178
(185)	Methi	(H & B)	125
(185)	Methika	(S)	125
(170)	Misurpurpu	(T)	100
(214)	Mitha pat	(B)	166
(189)	Mudgaparni	(S)	130
(189)	Mugani	(B)	130
(128)	Mulaippal-virai	(T)	33
(150)	Mungphali	(H)	70
(219)	Mushkadana	(H & B)	172
(219)	Musk mallow	(E)	172
	N		
(212)	Naageswar	(H)	162
(211)	Nagakesar	(S)	161
(212)	Nagakeshara	(S)	163
(211)	Nagappu	(T)	161
(228)	Nagbala	(S)	186
(212)	Nageswar	(B)	163
(211)	Nagkesar	(H & B)	161
(223)	Nalita	(S)	178
(212)	Nangu	(T)	163
(173)	Narivengai	(T)	104
(124)	Nata	(B)	27
(194)	Needle wood	(E)	135
(168)	Neel	(H & B)	97
(132)	Negro coffee	(E)	42
(226)	Nilatutti	(T)	182
(130)	Nila virai	(T)	35
(168)	Nili	(T)	98
(168)	Nilini	(S)	97
(191)	Nirumari	(T)	132
(206)	Nunbora	(B)	150
	O		
(231)	Ottatti	(T)	190
(217)	Ottupullu	(T)	170
	P		
(116)	Paddam	(H)	13
(116)	Padmak	(S & B)	13
(132)	Paeravirai	(T)	42
(229)	Palampasi	(T)	187
(152)	Palash	(H & B)	73
(152)	Palasha	(S)	73
(153)	Palas lata	(H)	75
(216)	Palisa	(T)	168
(164)	Palita-mandar	(B)	92
(200)	Paniala	(H & B)	142
(189)	Panipayer	(T)	130
(160)	Panlata	(H & B)	83
(193)	Papaya tree	(E)	134
(193)	Papita	(H)	134
(193)	Pappayi	(T)	134
(152)	Parasa	(T)	73

Plant No.			Page
(230)	Paras-pipal	(H & B)	188
(222)	Paratti	(T)	177
(164)	Paribhadra	(S)	92
(230)	Parisha	(S)	188
(193)	Parisha	(S)	134
(112)	Parshanabheda	(S)	7
(216)	Parusha	(S)	168
(114)	Patala	(S)	10
(127)	Patang	(H & B)	31
(112)	Patharchur	(H)	7
(112)	Patharkunchi	(B)	7
(127)	Patranga	(S)	31
(174)	Pattani	(T)	109
(214)	Pattasaka	(S)	166
(127)	Patungam	(T)	31
(128)	Paundaryam	(S)	33
(174)	Pea	(E)	109
(126)	Peacock flower	(E)	30
(193)	Penpe	(B)	134
(225)	Peramutti	(T)	181
(214)	Peratti	(T)	166
(176)	Perumbay	(T)	112
(220)	Perum tutti	(T)	174
(220)	Petari	(B)	174
(216)	Phalsa	(H & B)	168
(154)	Pigeon pea	(E)	76
(191)	Pisula	(S)	132
(120)	Pitakanchana	(S)	22
(178)	Pitasara	(S)	115
(178)	Pitashal	(B)	115
(227)	Pit-berela	(B)	184
(186)	Pithvan	(H)	126
(175)	Pongam	(T)	110
(172)	Poonaikkali	(T)	102
(230)	Poovarasam	(T)	188
(200)	Prachinamalak	(S)	142
(187)	Prasniparni	(S)	127
(228)	Prickly sida	(E)	186
(186)	Prisniparni	(S)	126
(223)	Pulichhai	(T)	178
(161)	Pulladi	(T)	84
(183)	Punaikkaivettlai	(T)	122
(200)	Puneala plum	(E)	142
(207)	Punnaga	(S)	151
(207)	Punnagam	(T)	151
(206)	Purusharatnam	(T)	150
(124)	Putikaranja	(S)	27

Q

(114)	Quince	(E)	10

R

(189)	Rakhalkalai	(H)	130
(179)	Raktachandana	(S, H & B)	117
(142)	Rakta-kambal	(B)	55
(122)	Rakta kanchan	(B)	24
(206)	Ratanpurus	(H)	150
(126)	Ratnagandhi	(S)	30

Plant No.			Page
(148)	Ratti	(H)	66
(179)	Red sandal wood	(E)	117
(129)	Ringworm senna	(E)	34
(151)	Rudanti	(S, H & B)	72
(215)	Rudraki	(H)	167
(215)	Rudraksha	(S, B & T)	167
(222)	Rui	(H)	177
(112)	Runakalli	(T)	7
	S		
(227)	Safed-beriala	(H)	184
(140)	Saikanta	(B)	52
(197)	Sal	(E)	139
(161)	Salpani	(B)	84
(141)	Salshai babla	(B)	54
(161)	Salwan	(H)	84
(157)	Sana	(S)	80
(157)	Sanal	(T)	80
(173)	Sandan	(E)	104
(187)	Sankarjata	(B)	127
(157)	Sannai, sunn	(H)	80
(127)	Sappan wood	(E)	31
(200)	Saralu	(T)	142
(182)	Sarphonka	(H)	121
(122)	Segapuman-chori	(T)	24
(163)	Sem	(H)	91
(224)	Semparuti	(T)	180
(147)	Sensitive plant	(E)	65
(197)	Shal	(H & B)	139
(161)	Shalaparni	(S)	84
(176)	Shami	(S & B)	112
(140)	Shami	(S)	52
(158)	Shanapushpi	(S)	81
(187)	Shankarajata	(B)	127
(182)	Sharapunkha	(S)	121
(117)	Shatapatri	(S)	15
(129)	Sheemai agatti	(T)	34
(146)	Shiah-kanta	(H)	64
(114)	Shimaimathala	(T)	10
(159)	Shinshapa	(S)	82
(157)	Shonpat	(B)	80
(134)	Sickle senna	(E)	44
(144)	Sirisha	(S, H & B)	61
(192)	Sirusavakku	(T)	133
(159)	Sishu	(H & B)	82
(159)	Sissoo	(E)	82
(159)	Sisu-itti	(T)	82
(187)	Sittirappaladai	(T)	127
(179)	Sivappu chan-danam	(T)	117
(130)	Sona-ka-pat	(H)	35
(130)	Sona-mukhi	(B)	35
(133)	Sophera senna	(E)	43
(165)	Soyabean	(E)	94
(120)	St. Thomas tree	(E)	22
(225)	Sugandha bala	(H)	181
(133)	Sularai	(T)	43
(207)	Sultan champa	(H & B)	151

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(157)	Sunn hemp	(E)	80
(201)	Svadukantaka	(S)	144
(180)	Swamp pea	(E)	118
(171)	Sweet clover	(E)	101
(119)	Swetakanchan	(S)	21
(183)	Swet ban-nil	(B)	122
(227)	Swet-berela	(S)	184
(183)	Swet sharapunkha	(S)	122
	T		
(134)	Tagarai	(T)	44
(209)	Tamal	(H & B)	154
(210)	Tamal	(H & B)	156
(209)	Tamala	(S)	154
(210)	Tamala	(S)	156
(210)	Tamalam	(T)	156
(136)	Tamarind tree	(E)	46
(123)	Tauri	(B)	26
(196)	Teli-garjan	(B)	137
(136)	Tentul	(B)	46
(125)	Teri pods	(E)	29
(154)	Thovary	(T)	76
(173)	Tinis	(B)	104
(173)	Tinsa	(H)	104
(173)	Tinisha	(S)	104
(213)	Titapat	(H & B)	164
(123)	Tividivi	(T)	26
(167)	Torki	(H)	96
(214)	Tossa jute	(E)	165
(147)	Tottalvadi	(T)	65
(169)	Triputi	(S)	98
(117)	Trose	(T)	15
(222)	Tula	(B)	177
(149)	Tula-ganari	(T)	68
(205)	Tuvrak	(S)	149
	U		
(215)	Ultrasum-bead tree	(E)	167
(188)	Ulundu	(T)	128
(125)	Umulkuchi	(B)	29
(188)	Urd	(H)	128
(198)	Uva	(T)	140
	V		
(144)	Vagei	(T)	64
(125)	Vakeri	(S)	29
(125)	Vakerimul	(H)	29
(177)	Vakuchibheda	(S)	114
(226)	Vala	(S)	182
(225)	Valak	(S)	181
(231)	Vana-bhenda	(S)	190
(150)	Varkadalai	(T)	70
(113)	Vatapatri	(S)	8
(218)	Vendai	(T)	171
(185)	Vendayam	(T)	125
(178)	Vengai	(T)	115
(202)	Vikankata	(S)	145
(138)	Vitkhadira	(S)	49

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(158)	Vittakillu	(T)	81

W

(213)	White jute	(E)	164
(182)	Wild indigo	(E)	121
(143)	Wunja	(E)	56

Y

(166)	Yashti-madhu	(S)	95
(195)	Yennai	(T)	136

LIST OF PLANTS, VOL. 1

A. FERNS AND FERN ALLIES (FILICINAE)

I. Adiantaceae

1. *Actiniopteris australis*(L.f.) Link; syn. *A. dichotoma* Kuhn; *A. radiata* Link
2. *Adiantum capillus-veneris* L.
3. *Adiantum incisum* Forsk. syn. *A. caudatum* L.
4. *Adiantum philippense* L. syn. *A. lunulatum* Burm.
5. *Adiantum venustum* G. Don

II. Polypodiaceae

6. *Drynaria quercifolia* J. Smith; syn. *Polypodium quercifolia* L.

III. Marsileaceae

7. *Marsilea minuta* L.

IV. Salviniaceae

8. *Azolla pinnata* R. Br. syn. *Salvinia imbricata* Roxb.
9. *Salvinia cucullata* Roxb.

B. GYMNOSPERMAE (CONIFERAE)

V. Pinaceae

10. *Abies spectabilis* (D. Don) Spach; syn. *A. webbiana* Lindl.
11. *Cedrus deodara* (Roxb. ex Lamb) G. Don; syn. *C. libani* Barrel. var. *deodara* Hook.f.
12. *Pinus roxburghii* Sarg. syn. *P. longifolia* Roxb.

C. FLOWERING PLANTS (ANGIOSPERMAE)

DICOTYLEDONAE

VI. Casuarinaceae

13. *Casuarina equisetifolia* J.R. & G. Forst

VII. Piperaceae

14. *Piper betle* L.
15. *Piper cubeba* L.f.
16. *Piper longum* L.
17. *Piper nigrum* L.
18. *Piper retrofractum* Vahl; syn. *P. chaba* Hunter non Blume; *P. officinarum* DC.

VIII. Salicaceae

19. *Salix tetrasperma* Roxb.

IX. Myricaceae

20. *Myrica esculenta* Buch-Ham. ex D.Don; syn. *M. nagi* Hook.f. in part, non Thunb.

X. Juglandaceae

21. *Juglans regia* L.

XI. Betulaceae

22. *Betula utilis* D.Don; syn. *B. bhojpattra* Wall.

XII. Fagaceae

23. *Quercus infectoria* Olivier

XIII. Moraceae

24. *Artocarpus heterophyllus* Lam.; syn. *A. integrifolia* L.f.
25. *Artocarpus lakoocha* Roxb.
26. *Ficus bengalensis* L.
27. *Ficus cunia* Buch.-Ham.
28. *Ficus glomerata* Roxb; syn. *F. racemosa* L.
29. *Ficus heterophylla* L.f.
30. *Ficus hispida* L.f.
31. *Ficus lucescens* Blume syn. *F. infectoria* Roxb.
32. *Ficus religiosa* L.
33. *Ficus rumphii* Blume

XIV. Cannabaceae

34. *Cannabis sativa* L.

XV. Olacaceae

35. *Olax scandens* Roxb.

XVI. Santalaceae

36. *Santalum album* L.

XVII. Loranthaceae

37. *Dendrophthoe falcata* (L.f.) Ettingsh.; syn. *Loranthus falcatus* L.f.
38. *Macrosolen cochinchinensis* (Lour.) Van Tieg.; syn. *Loranthus globosus* Roxb.

XVIII. Aristolochiaceae

39. *Aristolochia bracteolata* Lam.; syn. *A. bracteata* Retz.
40. *Aristolochia indica* L.

XIX. Polygonaceae

41. *Polygonum recumbens* Royle
42. *Rheum emodi* Wall. ex Meissn.
43. *Rumex maritimus* L.
44. *Rumex vesicarius* L.

XX. Chenopodiaceae

45. *Chenopodium album* L.
46. *Chenopodium ambrosioides* L.
47. *Spinacia oleracea* L.

XXI. Amaranthaceae

48. *Achyranthes aspera* L.
49. *Aerva lanata* Juss. ex Schult.
50. *Alternanthera sessilis* DC.
51. *Amaranthus spinosus* L.
52. *Amaranthus tricolor* L.; syn. *A. tristis* L.
53. *Celosia argentea* L.

54. *Celosia cristata* L.

XXII. Nyctaginaceae

55. *Boerhaavia diffusa* L.; syn. *B. repens* L.
56. *Mirabilis jalapa* L.
57. *Pisonia aculeata* L.

XXIII. Aizoaceae

58. *Glinus oppositifolius* (L.) A.DC.; syn. *Mollugo spergula* L.
59. *Trianthema portulacastrum* L.; syn. *T. monogyna* L.

XXIV. Basellaceae

60. *Basella alba* L.var. *rubra* L.

XXV. Portulacaceae

61. *Portulaca oleracea* L.
62. *Portulaca quadrifida* L.

XXVI. Caryophyllaceae

63. *Vaccaria pyramidata* (L.) Medik.; syn. *Saponaria vaccaria* L.

XXVII. Cactaceae

64. *Opuntia dillenii* Haw.

XXVIII. Nymphaeaceae

65. *Eurylae ferox* Salisb.
66. *Nelumbo nucifera* Gaertn.; syn. *Nelumbium speciosum* Willd.
67. *Nymphaea alba* L.
68. *Nymphaea nouchali* Burm.f.; syn. *N. lotus* Hook.f. & Thoms. non L.; *N. pubescens* Wild; *N. rubra* Roxb. ex Salisb.

XXIX. Annonaceae

69. *Annona reticulata* L.
70. *Annona squamosa* L.
71. *Polyalthia longifolia* Thw.

XXX. Myristicaceae

72. *Myristica fragrans* Houtt.

XXXI. Lauraceae

73. *Cassytha filiformis* L.
74. *Cinnamomum camphora* (L.) Nees & Eberm.
75. *Cinnamomum tamala* Nees & Eberm.
76. *Cinnamomum zeylanicum* Breyn.
77. *Litsea glutinosa* (Lour.) C.B. Robins.; syn. *L. chinensis* Lam; *L. sebifera* Pers.
78. *Litsea monopetala* (Roxb.) Pers.; syn. *L. polyantha* Juss.

XXXII. Magnoliaceae

79. *Magnolia pterocarpa* Roxb.; syn. *M. sphenocarpa* Roxb.
80. *Michelia champaca* L.

XXXIII. Ranunculaceae

81. *Aconitum ferox* Wall. ex Ser.
82. *Aconitum heterophyllum* Wall. ex Royle
83. *Aconitum napellus* L.
84. *Clematis triloba* Heyne ex Roth.
85. *Delphinium denudatum* Wall.
86. *Naravelia zeylanica* DC.
87. *Nigella sativa* L.
88. *Paeonia emodi* Wall. ex Royle
89. *Ranunculus sceleratus* L.

XXXIV. Berberidaceae

90. *Berberis aristata* DC.
91. *Podophyllum hexandrum* Royle; syn. *P. emodi* Wall. ex Hook.f. & Thoms.

XXXV. Menispermaceae

92. *Anamirta cocculus* Wt. & Arn.; syn. *A. paniculata* Colebr.
93. *Cissampelos pareira* L.
94. *Cocculus hirsutus* (L.) Diels.; syn. *C. villosus* DC.
95. *Stephania japonica* Miers; syn. *S. hernandifolia* Walp.

96. *Tiliacora acuminata* (Lam.)Miers; syn. *T. racemosa* Colebr.

97. *Tinospora cordifolia* (Willd.) Miers ex. Hook.f. & Thoms.

98. *Tinospora sinensis* (Lour.) Merr.; syn. *T. tomentosa* Miers ex Hook.f. & Thoms; *T. malabarica* (Lam.) Hook.f. & Thoms.

XXXVI. Papaveraceae

99. *Argemone mexicana* L.

100. *Papaver somniferum* L.

XXXVII. Brassicaceae (Cruciferae)

101. *Brassica campestris* L. var. *sarson* Prain

102. *Raphanus sativus* L.

103. *Lepidium sativum* L.

XXXVIII. Capparidaceae

104. *Capparis sepiaria* L.

105. *Capparis zeylanica* L.; syn. *C. horrida* L.f.

106. *Cleome icosandra* L.; syn. *C. viscosa* L.

107. *Crataeva nurvala* Buch.-Ham.; syn. *C. religiosa* Hook.f. & Thoms. non Forst f.

108. *Cleome gynandra* L.; syn. *Gynandropsis pentaphylla* (L.) DC.; *G. gynandra* Briq

XXXIX. Fumariaceae

109. *Fumaria vaillantii* Loisel; syn. *F. indica* Pugsley; *F. parviflora* ssp. *vaillantii* (Loisel.) Hook.f.

XL. Moringaceae

110. *Moringa oleifera* Lam.; syn. *M. pterygosperma* Gaertn.

XLI. Droseraceae

111. *Drosera burmannii* Vahl.

Professor (Mrs) Asima Chatterjee, D.Sc. (Calcutta), D.Sc. (honoris causa, Burdwan and Banaras Hindu Universities), F.N.A., FASc., (born 1917), former Khaira Professor and Head of the Department of Pure Chemistry, Calcutta University, is currently the Co-ordinator of the Centre of Advanced Studies on Natural Products, Department of Pure Chemistry, Calcutta University. She obtained her D.Sc. degree working with Prof.P.K. Bose, Calcutta University, and later carried out post-doctoral research with Prof. L. Zechmeister, California Institute of Technology, USA, and Prof. P. Karrer, N.L., University of Zürich, Switzerland.

Prof. Chatterjee has made significant contributions on natural products (alkaloids, terpenoids and polyphenolics), medicinal chemistry and mechanistic organic chemistry for nearly half a century. This has earned her international recognition. She is the recepient of the S.S. Bhatnagar Award of the CSIR, New Delhi, Sir P.C. Ray Lectureship of the Indian Chemical Society, Sir C.V. Raman Award of the Hari Om Trust by the University Grants Commission, the Sisir Kumar Lectureship of the Indian National Science Academy, Sir Asutosh Mookerjee Medal of the Indian Science Congress and the Padma Bhushan (Government of India).

Prof. Chatterjee has published more than 300 research papers, 19 review articles and edited six volumes of the revised edition of *Bharatiya Banousadhi*, a treatise in Bengali on Indian Medicinal Plants, published by Calcutta University.

Dr Satyesh Chandra Pakrashi, Ph.D. (born 1930), formerly Director, Indian Institute of Chemical Biology, Calcutta holds the prestigious post of a CSIR Distinguished Fellow. He is also an extramural teacher in the Department of Biochemistry, Calcutta University, for more than two decades and an honorary Professor of the Guha Institute of Biochemistry, Calcutta.

A former student of Professor (Mrs) Asima Chatterjee, Dr Pakrashi worked/collaborated with eminent natural products chemists — Prof. Carl Djerassi (Wayne, USA), Prof. K. Bleman (Massachusetts Institute of Technology, USA) and Prof. R.B. Woodward, N.L. (Harvard, USA).

Dr Pakrashi has made outstanding contributions on the chemistry of natural products, particularly alkaloids and terpenoids. He is a Fellow of the Indian National Science Academy and a recepient of the Basudev Memorial Award of the Indian Chemical Society. He has published nearly 160 research papers, 16 review articles and 12 patents.